DOCUMENT RESUME

ED 326 410 SE 051 769

TITLE The Web of Life. Community Study Unit, Grade 3. Teacher Edition, Field Trip Guide for Teachers, and Student Edition.

INSTITUTION Lee County School District, Ft. Myers, FL. Dept. of Environmental Education and Instructional Development Services.

PUB DATE 89

NOTE 103p.; For related documents, see SE 051 766-777.

AVAILABLE FROM Department of Environmental Education, Lee County Schools, 2055 Central Avenue, Ft. Myers, FL 33901 ($2.50).

PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052) -- Guides - Classroom Use - Materials (For Learner) (051) --

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.

DESCRIPTORS *Ecology; Educational Objectives; *Elementary School Science; Experiential Learning; *Field Trips; *Grade 3; *Interdisciplinary Approach; Primary Education; Science Activities; Science Education; Teaching Guides

IDENTIFIERS 4Mat System Model; Food Web

ABSTRACT

The purpose of this community study unit is to introduce third grade students to the concept of the food web and to guide them in an investigation of the interrelationships among living things within a community. In the first section, students examine their own diets, and then extend this examination to the diets of some familiar animals. Classroom activities are provided to demonstrate the way a food chain is expanded to a more complex, interconnected food web. In section 2, the students are presented with the major portion of the content for the unit. The third section consists of a day-long field experience. The final section includes an examination of the data collected on the field trip. Included in this set of documents are an overview, objectives, teacher's guide, a field trip guide for teachers, and four sections of activities. Appendices include the 4Mat model, an application of this unit to the 4Mat model, a cognitive pre/posttest, a student guide to mudflat ecology, a glossary, a discussion of scheduling considerations, and a parent permission form. (CW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION

The WEB of LIFE

TEACHER EDITION

ED326410

SE051769

COMMUNITY STUDY UNIT

GRADE 3

LEE COUNTY SCHOOLS

THE SCHOOL DISTRICT OF LEE COUNTY

2055 Central Avenue
Fort Myers, Florida 33901

Dr. James Adams
Superintendent

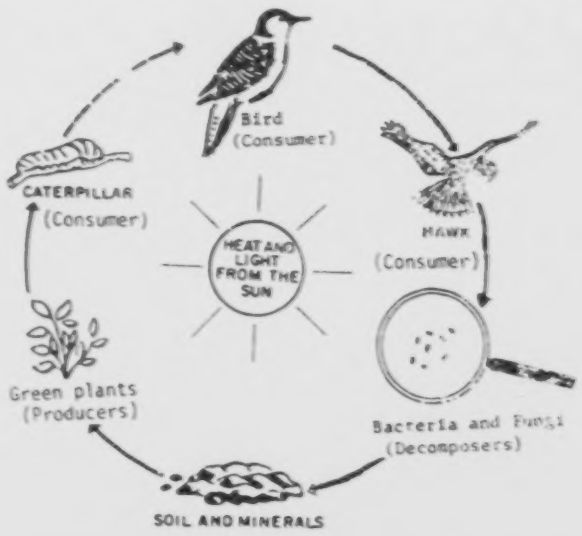
Dr. Charles Godwin
Assistant Superintendent of Instruction

Dr. J. P. Lutz
Director
Elementary Education

Mr. William Hammond
Director
Environmental Education and Instructional Development Services

Overview

Living things are interrelated in a complex food web. These living things can be classified as producers, consumers, or decomposers. The sun's energy is captured by green plants (producers). Animals (consumers) get their energy by eating plants or other animals. Bacteria and fungi (decomposers) get their energy from the bodies of dead plants and animals. Through this process energy flows into and out of the food web while matter continues to cycle over and over.



This study unit gives the student the opportunity to explore some of the relationships in this food web through classroom activities and a field experience in a mudflat community.

TABLE OF CONTENTS

Overview 1
Continuum Connections. 3
Concepts - Objectives. 4
Introduction 5
SECTION 1 - *A Reason for Learning* 7
Pre-Test 7
What Do You Eat? 7
Why Eat? 7
Pet Food 7
Food Chains. 8
Food Pyramids. 8
Last One 9
Changes. 9
SECTION 2 - *Teaching and Learning* 11
Definitions. 11
Food Sources 13
Sun Food 13
Bucket Brigade 14
Changes Revisited. 15
Bingo Game 16
Vocabulary 16
Trip Talk. 16
SECTION 3 - *Trying It Out* 17
Field Experience Information 17
Trip Leadership Responsibilities 21
SECTION 4 - *Self Teaching & Extending* 23
Analysis 23
Reports. 23
Bulletin Board 24
Plants That Consume. 24
Playing Favorites. 24
Supermarket. 25
Post-Test. 25
APPENDIX. 27
The Complete 4MAT System Model 29
The Teacher's Role: A Recapitulation. 30
4MAT System Model for The Web of Life Study Unit . . . 31
Cognitive Pre/Post Test. 32
Pre-Post Cognitive Test Answer Key 35
Web of Life Student Guide. 37
Glossary 63
Scheduling Considerations. 65
Parent Permission Form 66

CONTINUUM CONNECTIONS

SCIENCE

2 Understand that the leaves of green plants produce food using water, minerals, carbon dioxide, and chlorophyll in the presence of light.

3 State the importance of stored plant food as a source of animal food.

4 Recognize that non-green plants do not make their own food.

4 Identify some common non-green plants such as mushrooms, fungi, and mold.

4 Describe the manner in which non-green plants obtain their food.

5 Understand that behavior is influenced by conditions in the environment.

7 Understand that the structures and functions of animals enable them to survive in a living community.

7 Identify ways in which animals secure food and protect themselves.

8 Recognize that animals may be classified as herbivores, carnivores, and omnivores.

8 List three examples of animals that are plant-eaters, and three that are meat-eaters.

8 Explain why plants are important to carnivores. Construct a food chain using these three classifications of animals.

9 Recognize that a balanced diet includes food selections from each of the four basic groups.

13 Recognize that many things live in the water.

14 Realize plants and animals living in the water are important sources of food for humans.

SOCIAL STUDIES

16 Describe how people have learned to use the environment to meet needs.

16 Explain why certain parts of the environment are more beneficial for some kinds of land use than others.

18 Define the word community and identify some characteristics of our community.

19 Identify ways in which communities and natural environments act upon each other.

CONCEPTS

1. All living things, including humans, are interrelated and therefore interdependent.
2. Living things can be categorized as producers, consumers, or decomposers.
3. The sun is the source of all the energy for the producer-consumer-decomposer cycle.
4. Living things are dependent upon the flow of energy through the producer-consumer-decomposer cycle.
5. As energy passes from one level to the next, within this cycle, energy is lost. Energy goes <u>one way</u>; it cannot be recycled.
6. When living things die, their "matter" recycles.

OBJECTIVES

The student will be able to:

1. define producer, consumer, and decomposer as these terms relate to the food web;
2. categorize living things as producers, consumers, or decomposers;
3. describe a simple food web showing the interdependence of the producers, consumers, and decomposers;
4. recognize and categorize foods that humans eat as coming from producers, consumers, or decomposers;
5. locate him/herself in the food web;
6. recognize that the sun is the source of all energy and that energy goes <u>one way</u>;
7. explain what matter is and that it cycles (used over and over again).

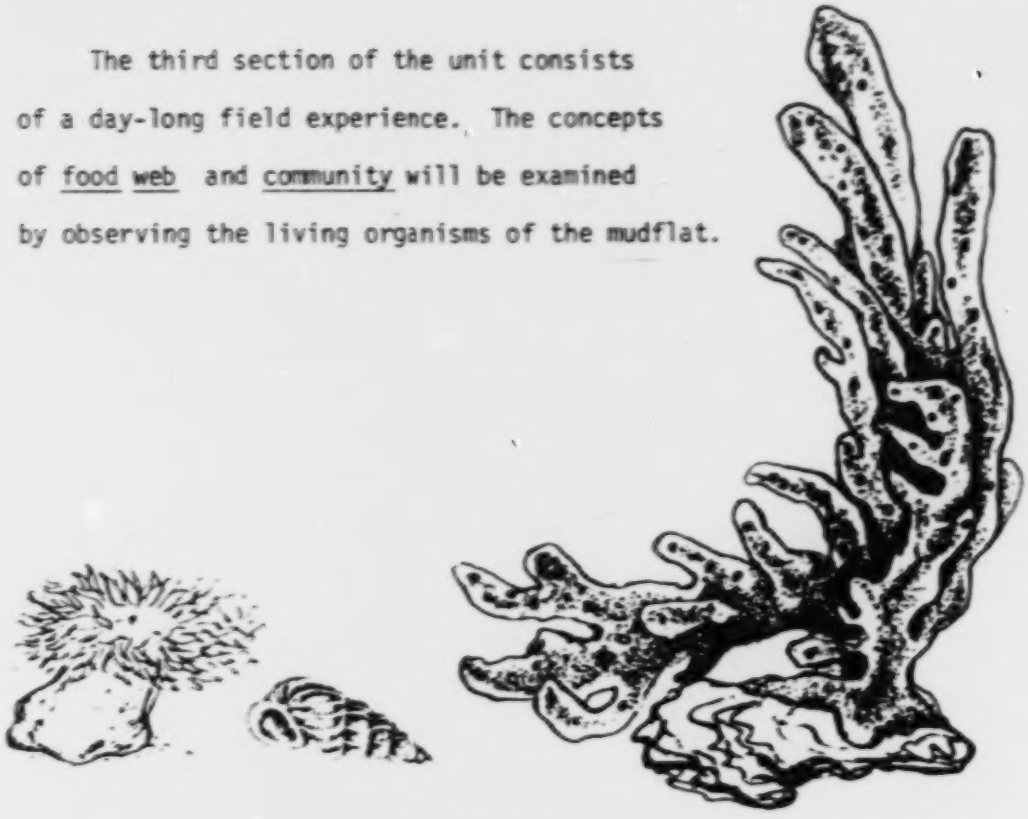
Introduction

The purpose of this community study unit is to introduce third grade students to the concept of food web and to guide them in an investigation of the interrelationships among living things within a community. The unit has been designed in accordance with the 4MAT Learning Styles System to assure greater participation by all students, in the learning experience. There are four sections to the unit.

In the first section, the students will examine their own personal diets, and then extend this examination to the diets of some familiar animals. Classroom activites are provided to demonstrate the way a food chain works. The idea of a simple food chain is expanded to a more complex, interconnected food web.

In section two, the students are presented with the major portion of the content for the unit. The terms producer, consumer, decomposer and associated vocabulary are introduced and discussed. The students will participate in an activity demonstrating energy flow through the food web.

The third section of the unit consists of a day-long field experience. The concepts of food web and community will be examined by observing the living organisms of the mudflat.



In the final section of the unit, the students will continue their investigation of the mudflat community through the analysis of the data collected during the trip. Groups of students will report to the rest of the class on research they have done on a particular group of organisms. An extension of the unit has the students visit the supermarket to look for some of the same relationships that they have seen in the earlier activities and during the field experience.

A Reason for Learning

Section 1

The activities in this section should provide students with experiences that directly link the unit concepts with their personal life experiences. Students must also have a chance to discuss those connections with one another. In this initial phase of the unit students should discover a reason for learning the instructional concepts.

1. PRE-TEST

   The Cognitive Pre-Post Test can be found in the Appendix (p. 32-34).

2. WHAT DO YOU EAT?

   Have the students list all of the food they eat in a week-long period. Categorize the food that they eat as meats, fruits and vegetables, dairy products, grains and cereals. Discuss with the students why we have "favorite foods" and why it is also important that we have a balanced diet. Do some of the students eat only fruits and vegetables? What are some of the reasons for this?

- french fries
- hamburger
- Salad
- milk
- cheese
- tuna fish
- pizza
- ice cream

3. WHY EAT?

   Have the students discuss the reasons we eat. What makes us hungry? How do we feel when we have not eaten for a long time?

4. PET FOOD

   Discuss the diet of some familiar animals, such as cats, dogs, fish, birds, hamsters, etc. Check pet food labels for ingredients. Why do these animals eat different things? Do these animals have "favorite foods?"

5. FOOD CHAINS

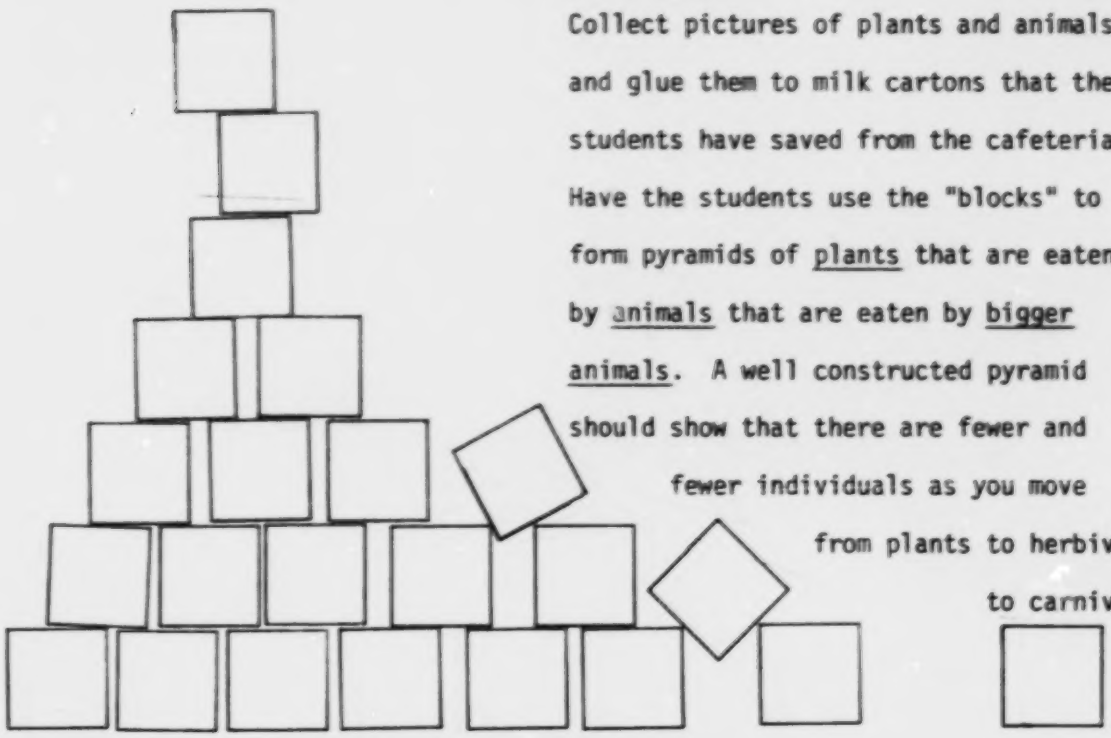
Assist the students in the construction of paper-link chains of living things that either eat or are eaten by the adjacent links.

Example:

A cat eats a mouse, which is eaten by an owl, which eats a snake, which eats a frog, which eats a bug, which is eaten by a bird, which eats a seed, which is eaten by a mouse... Encourage cross-linking of the chain and linking chains with those of other students. The students should be experiencing the complexity of the food web. At this point, emphasis should not be placed upon factually correct connections. Anything within reason is legitimate.

6. FOOD PYRAMIDS

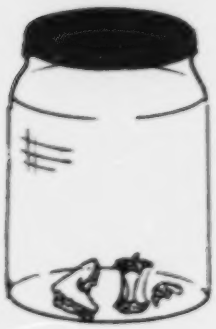
Collect pictures of plants and animals and glue them to milk cartons that the students have saved from the cafeteria. Have the students use the "blocks" to form pyramids of plants that are eaten by animals that are eaten by bigger animals. A well constructed pyramid should show that there are fewer and fewer individuals as you move from plants to herbivores to carnivores.



7. LAST ONE

Arrange a circle of chairs in the center of the room. These will be used to play "Last One to the Table Goes Hungry." Let each of the students choose to be an animal that eats plants or an animal that eats other animals. The teacher may provide a list of animals from which to choose, and the students may make signs to wear around their necks indicating what animal they are. The chairs are to be the plants, all of the animals that eat plants should sit on chairs. There should be fewer animals that eat other animals than animals that eat plants. The game proceeds as in "Musical Chairs." The students proceed around the circle of plants until the music stops, and then everyone must find something to eat. The animals that eat plants must find a plant to sit on. The animals that eat other animals must find two animals that eat plants sitting next to each other and sit on the knees of these two animals. One by one, the plants are removed from different parts of the circle, leaving spaces, and those animals that cannot find something to eat are out of the game.

8. CHANGES



Select several pieces of food (lunch scraps) and place them in a large jar and seal tightly. Let this jar stand for several days to a week and then observe any changes that have occurred. Be sure to investigate any changes in smell as well as in appearance. This activity is an introduction to a group of living things that have not yet been discussed - the decomposers. We will come back to this demonstration in Section Two.

Teaching & Learning... information

Section 2

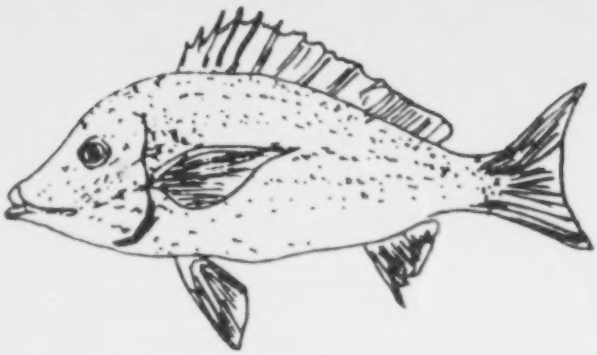
The activities in this section should focus on what the student needs to know in order to understand the concepts in the unit. The student should acquire information from the teacher, films, supplemental readings, the library, or experts, etc. in order to develop a foundation of knowledge basic to understanding the instructional concepts.

1. DEFINITIONS

Define and discuss what is meant by the terms *producer*, *consumer*, and *decomposer*. Give an example of each, using those plants and animals discussed in the previous section.

Producers - living things that are able to make their own food using the energy from the sun. By converting this energy into a form that other living things can use, the producers form a very important part of the food web.

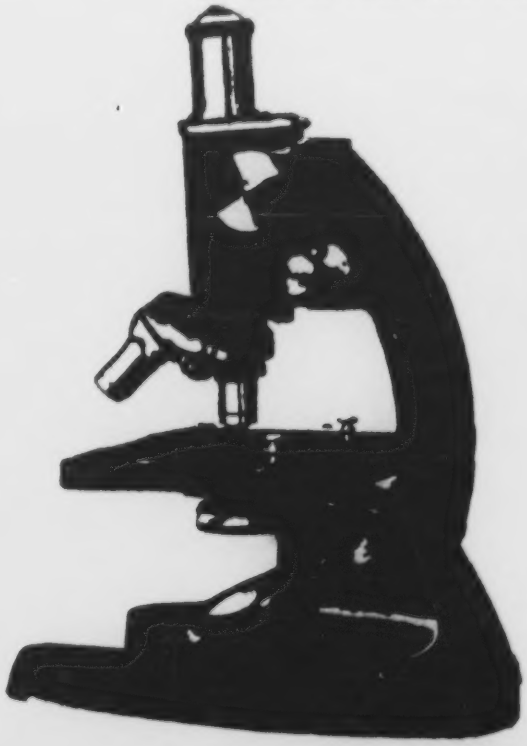
Consumers - living things that are not capable of making their own food and must eat plants and other animals to obtain the energy necessary for survival.



This group can be divided into three subgroups:

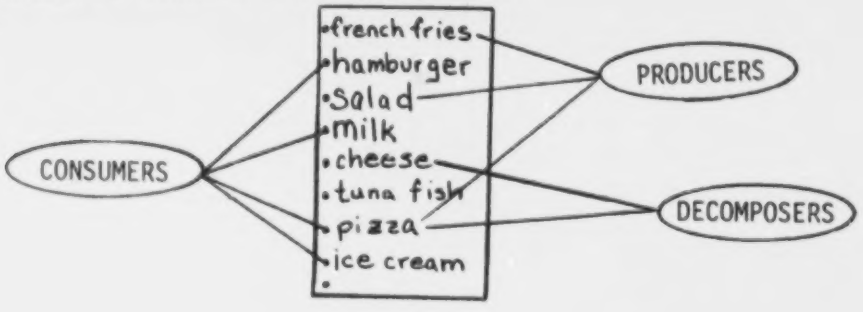
herbivores - those consumers that eat plants.
carnivores - those consumers that eat animals.
omnivores - those consumers that eat both plants and animals.

Decomposers - those living things, such as bacteria and fungi, that break down the remains and waste products of plants and animals. These remains can then be reused by products. Often, decomposers are microscopic, and must be magnified to be seen. Mushrooms and some other fungi are decomposers that can be seen with the naked eye.



2. FOOD SOURCES

Using the list of foods eaten by the students over a week-long period (Section I, Activity 2), categorize the foods as products of producers, consumers, or decomposers.



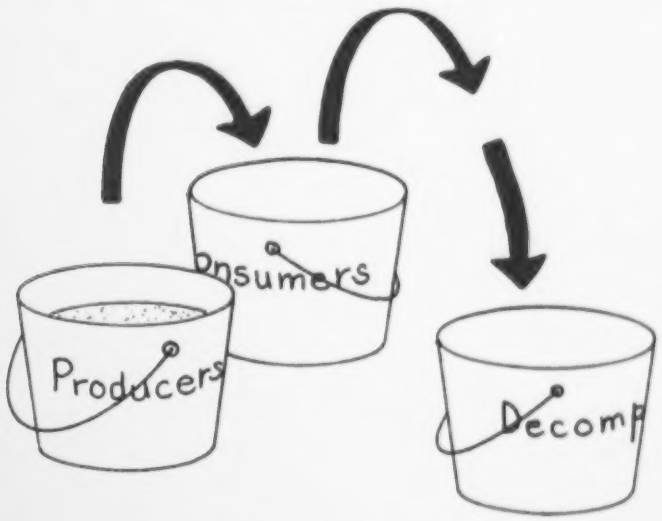
3. SUN FOOD

Show the film, Food From the Sun, - - - 11.0770.

If we, as consumers, get our energy from the food that we eat, where do the producers get their energy? Discuss with the students how plants are able to make their own food using the energy from the sun. Terms such as chlorophyll and photosynthesis may be introduced to the students if the teacher desires. The concept, and not the vocabulary, should be stressed.

4. BUCKET BRIGADE

The flow of energy through the producer/consumer/decomposer cycle can be demonstrated with a simple activity, best conducted outdoors on the school campus. Obtain three large bowls or buckets of the same size. Label them Producers, Consumers, and Decomposers. Separate the buckets by some distance. Fill the Producer bucket to the rim with water. If three containers of the same size are not available, measure the volume or depth. This water will represent the energy from the sun.

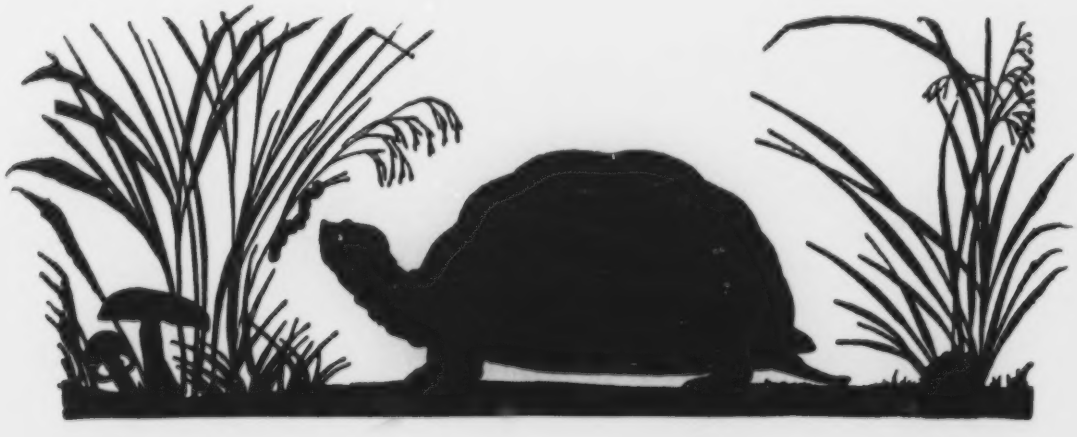


Let the students take turns transferring the water from the Producer bucket to the Consumer bucket, using a large sponge. When the Producer bucket is empty, have them transfer the water from the Consumer bucket to the Decomposer bucket. When this has been completed, measure the amount of water in the Decomposer bucket to see if there has been a loss of water during the activity. Just as in all natural systems, when we go from one level to the next, there is some loss of energy.

5. CHANGES REVISITED

What changes have the students seen in the jar of food pieces that they put together back in Section 1? What has caused these changes? Discuss the process of decomposition by these microscopic living things.

The bacteria and fungi that have caused the changes in the food in the jar are present in the air all of the time. This is why we must keep food in tightly closed containers and in the refrigerator to prevent spoilage. These decomposers break down dead plants and animals. The materials that the plants and animals are made up of can then be reused by new plants and animals. Just as there is a limited amount of energy flowing through the system, there is a limited amount of material to make new plants and animals, but this material can be used over and over again.



6. BINGO GAME

Use pictures from the Student Mudflat Guide to make a simple bingo game. This will help to familiarize students with the variety of living things they may see on the community study trip to the mudflat.

7. VOCABULARY

algae	food chain
bacteria	food web
carnivore	fungi
colony	matter
community	herbivore
consumer	microscopic
cycle	mudflat
decay	omnivore
decomposer	organism
dependent	producer
diet	related
energy	tide

8. TRIP TALK

(Optional: Show the film, We Explore the Beach - - - 11.0527.) Outline with the students the purpose of the field experience at the mudflat community. Discuss the activities for the trip as described in Section 3 of this unit. Advise the students to wear old clothing and tie-on sneakers or some other footwear that they can get wet, and that will not slip off - no sandals or "flip-flops." Contact the Department of Environmental Education and Instructional Development Services for further details.

Trying It Out ... field trip

Section 3

The activities in this section establish the required information procedures, rules, and student work assignments for the community study field trip. The primary purpose of this section includes firsthand field trip experiences and activities for students to try out in a real world situation the information they have acquired.

FIELD EXPERIENCE INFORMATION

The students will be transported to the mudflat area by a field leader from the Department of Environmental Education and Instructional Development Services. Upon arrival, the field leader and the classroom teacher will review with the students what the field experience is designed to do, and outline the activities so that the students will know what is expected of them.

First, the students will be asked to explore the mudflat and observe and collect as many different kinds of living things as they are able to find. They will be working in small groups. Depending upon the tide, the water will be between ankle and waist deep. It is extremely important that the students be aware that these organisms are alive and that great care must be taken not

to injure or destroy any of the living material on the mudflat. The collected organisms will be placed into buckets and trays provided by the field leader. The students will be instructed that we are searching for living things, or evidence of living things, and the wide variety of plants must not be overlooked. Both the classroom teacher and the EE field leader will pass from group to group to help students with collecting.

When sufficient material has been collected, the buckets will be brought to shore and the materials collected will be sorted into trays in a number of ways. The students will help separate producers from consumers. Each of these groups can then be further divided into type (grass, algae, crabs, shrimp, fish, shells, etc.). The teacher may elect to establish several "specialist" groups of students to gather a little more information on each of these subdivisions. These specialist groups might put together a presentation to give to the rest of the class. Some of the things that these groups could look into are what the organisms eat or are eaten by, how they get their food, where they live on the mudflat, what adaptations they have for living there, etc.

When the materials have been divided by type, the students can go through the Mudflat Guide provided by the field leader and check off those plants and animals that they were able to find. The students should also consider those animals that they were able to observe but not collect. A tally of the number of different kinds of organisms should also be made.

The students will be looking for evidence of decaying plants and animals by smelling a handful of muck collected from the mudflat. The strong smell comes from the decomposition of dead plant and animal matter.

Strong chemicals are released when this material decomposes, and all of the organisms that live in the mud at the mudflat must develop some sort of protective covering to survive. We will try to observe as many of these coverings as possible.

When all of the categorizing, tallying, and discussion have been completed, all of the organisms will be carried out onto the mudflat to be released. The students should understand the need for returning these plants and animals to the area from which they were collected. In this way, the effect of the class' study on the mudflat can be minimized.

LUNCH - Bag lunches should be brought from home or obtained from the lunchroom at school. Check with your principal and the lunchroom staff for details. There may or may not be restroom facilities available, depending on which field site is used.

If time permits, there will be an activity or two led by the field leader drawing upon some of the observations that the students made during the morning. Possible activities include group animal charades or a predator-prey game.

TRIP LEADERSHIP RESPONSIBILITIES

The EE/IDS field leader will:

1. transport students to field site;
2. establish rules to be followed throughout the day;
3. orient class to mudflat community and activities for the day;
4. initiate and co-lead all field trip activities;
5. help organize and supervise lunch activities.

The classroom teacher will:

1. have students prepared for the field trip experience by implementing pre-trip activities and informing students of what to expect;
2. ensure that students wear old clothes and tie-on shoes that they can get wet and muddy;
3. prepare and collect permission slips;
4. have students and lunches ready when the bus arrives at school;
5. divide class into groups of 3-6 students to work together at the mudflat;
6. help EE/IDS field leader maintain appropriate behavior;
7. assist students in collection on the mudflat;
8. help EE/IDS field leader in leading the discussions during and after observations of collected material;
9. establish "specialist" groups to encourage students to find further information;
10. help organize and supervise lunch distribution.

Any chaperons:

1. are optional;
2. should participate in all activities;
3. should assist the teacher and students as needed;
4. are expected to follow the same rules as everyone else - (no smoking, appropriate clothing, etc.).

Self Teaching & Extending

Section 4

The activities in this section should encourage students to self discover "new connections" that integrate their experiences with new applications related to the instructional concepts. Students are encouraged to teach others what they know, or to create new ways of expressing or applying what they have learned.

1. ANALYSIS

Using the Tally Sheet (page 21) in the Student Mudflat Guide, analyze the information collected on the trip. For example, did it seem like there were more plants on the mudflat than there were animals? How many different kinds of producers were collected or observed? How many different kinds of consumers? What would happen to the animals if all of the plants were suddenly to disappear? What would happen to the plants and animals if there were no decomposers in the muck on the mudflat? What would happen to the mudflat community if the sun's energy were taken away?

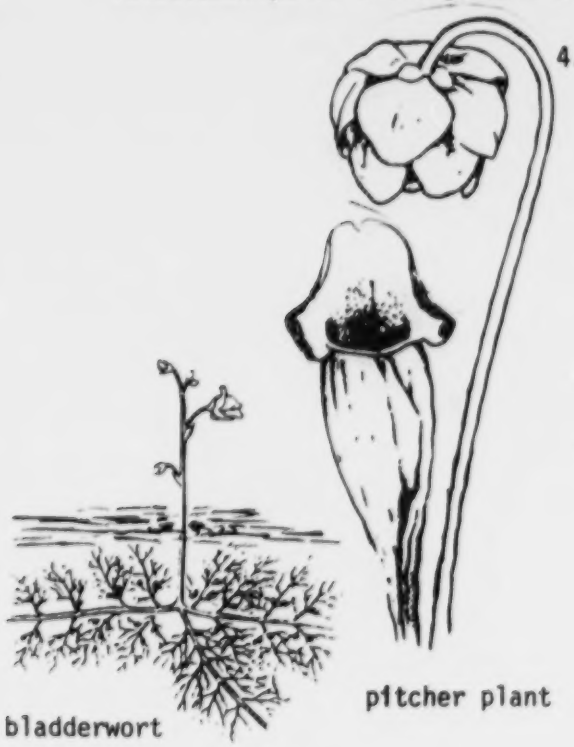
2. REPORTS

Have the specialist groups report to the rest of the class on what they were able to discover about their organisms. Encourage the groups to use any method of

presentation with which they feel comfortable. Drawings, models, dances, skits, music, and reports all might be employed where appropriate.

3. BULLETIN BOARD

Help the students to create a bulletin board of the things that they saw at the mudflat. Drawings, murals, poems, short stories, and three-dimensional models can all be used to help show the relationships of the organisms of the mudflat community.



pitcher plant

bladderwort

4. PLANTS THAT CONSUME

Students have seen that most of the plants at the mudflat were producers. Discuss with the students the existence of plants that are also consumers. The Venus fly-trap, the pitcher plant, the bladderwort, and sundew are capable of capturing insects. While these plants are capable of making their own food, they also obtain some of their nutrients from insects.

5. PLAYING FAVORITES

The students will undoubtedly be able to list some of their "favorite" foods, and some of their least favorite foods. If you were a hermit crab, what would be your favorite food? What would you do if you could not find any of this favorite food?

6. SUPERMARKET

For a homework assignment, have students go to a supermarket, study the foods on the shelves, and try to categorize them as producers, consumers, and decomposers. What foods can be found that might have come from an area like the mudflat visited on the field trip? Pick some other foods and try to determine what the area from which they came might have been like. A selection of pictures provided by the teacher may help with this activity.

7. POST-TEST

Readminister the Cognitive Pre-Post Test found in the Appendix, pages 32 to 34.

APPENDIX

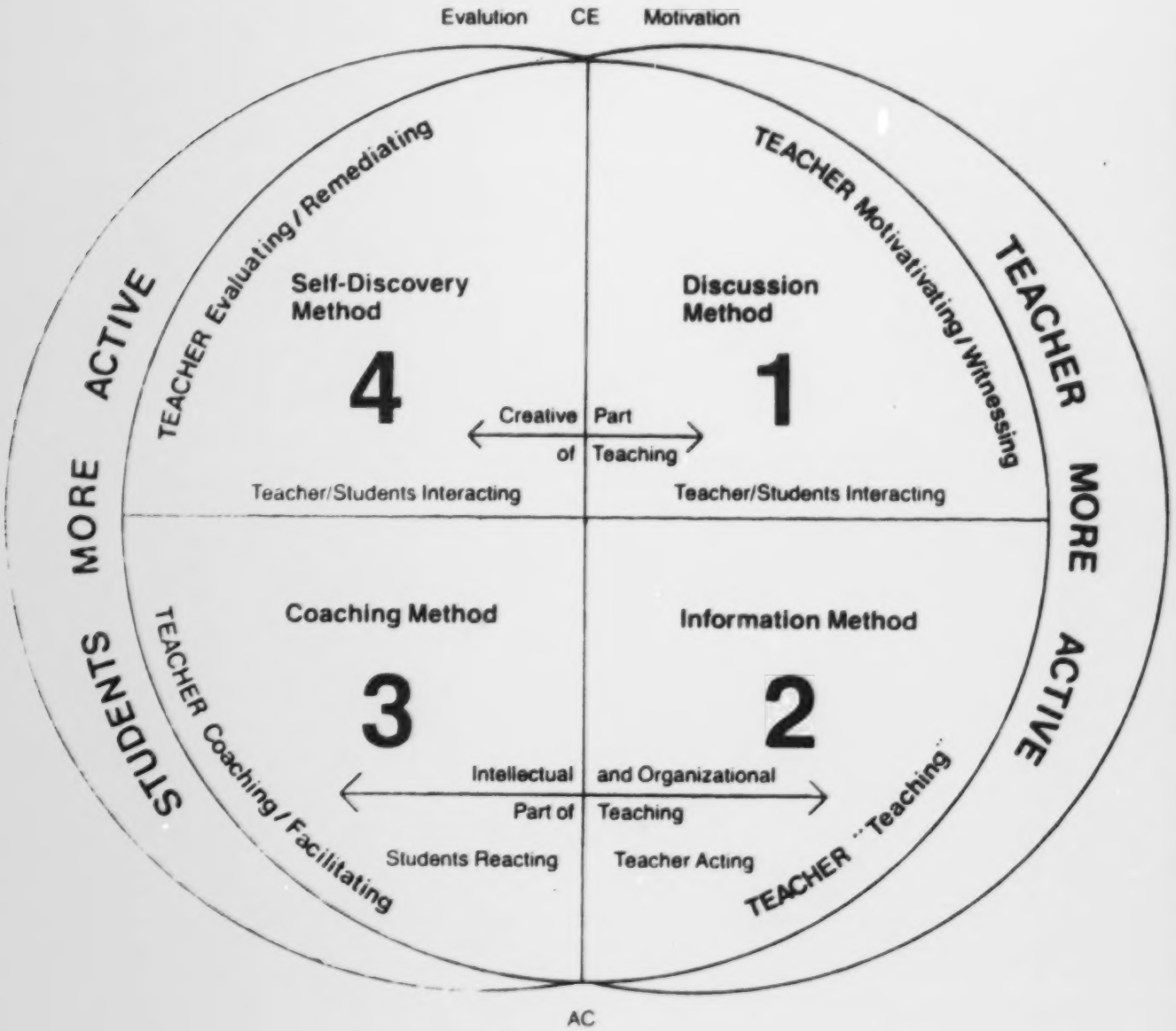
© EXCEL, INC. 1979
All Rights Reserved

The Complete 4MAT System Model

The Teacher's Role: A Recapitulation

The teacher's role changes as s/he moves through the cycle of learning:

- from Motivator/Witness
- to Teacher/Information Giver
- to Facilitator/Coach
- to Evaluator/Remediator and Resource.



© EXCEL, INC

4MAT SYSTEM MODEL
FOR
THE WEB OF LIFE STUDY UNIT

COGNITIVE PRE/POST TEST

3rd Grade - WEB OF LIFE

Read the following statements. Choose the most correct answer.

1. A food chain can show you

   [a] where all the fast food chain stores are.
   [b] what is eaten by what.
   [c] how long an animal lives.
   [d] how many hungry children there are in the world.

2. A mudflat is

   [a] a pond that has dried up.
   [b] a shallow freshwater puddle.
   [c] a shallow place in the bay with a lot of living things.
   [d] the only place near here that has producers, consumers, and decomposers.

3. A producer is a living thing that

   [a] makes its own food out of sunlight, water, soil, and air.
   [b] eats other living things to stay alive.
   [c] stays alive by rotting dead plants and animals.
   [d] eats things from the produce section at the grocery store.

4. A consumer is a living thing that

   [a] stays alive by rotting dead plants and animals.
   [b] makes its own food out of sunlight, water, soil, and air.
   [c] has to use money to buy all its food.
   [d] eats other living things to stay alive.

5. A decomposer is a living thing that

   [a] is usually very large.
   [b] stays alive by rotting dead plants and animals.
   [c] eats other living things to stay alive.
   [d] makes its own food out of sunlight, water, soil, and air.

6. Most plants are

   [a] producers.
   [b] consumers.
   [c] decomposers.
   [d] omnivores.

7. Most animals are
   [a] decomposers.
   [b] reducers.
   [c] producers.
   [d] consumers.

8. Most decomposers are
   [a] producers.
   [b] not alive.
   [c] microscopic.
   [d] very large.

9. A food web is
   [a] a group of the same kind of plants or animals living or growing together.
   [b] a number of food chains that are interconnected.
   [c] too small to be seen without a microscope.
   [d] the stuff of which plants and animals are made.

10. When something decomposes,
   [a] it rots.
   [b] it decays.
   [c] it gets used again.
   [d] all of the above.

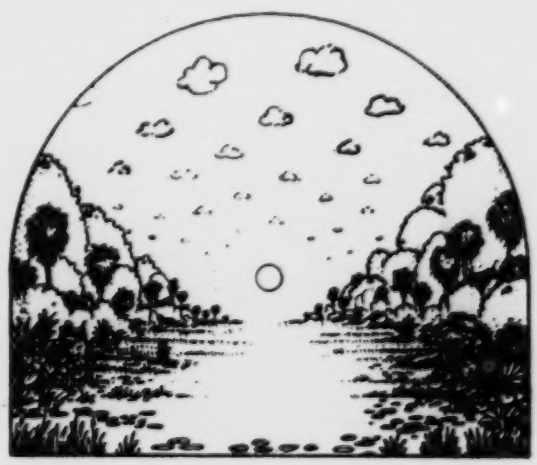
11. The energy that is used in the food web comes from
   [a] the sun.
   [b] the plants.
   [c] the water.
   [d] the decomposers.

12. Bacteria are
   [a] found only in mud.
   [b] the only kind of rotter we know.
   [c] a type of decomposer.
   [d] all of the above.

13. Algae are
    [a] found only in the ocean.
    [b] food for many tiny animals.
    [c] never eaten by people.
    [d] very hard to find.

14. The milk we drink comes from
    [a] producers.
    [b] consumers.
    [c] decomposers.
    [d] all of the above.

15. A sausage and mushroom pizza comes from
    [a] producers.
    [b] consumers.
    [c] decomposers.
    [d] all of the above.



The Web of Life

Community Study Unit, Grade 3

Pre-Post Cognitive Test Answer Key

ITEM	ANSWER
1.	b
2.	c
3.	a
4.	d
5.	b
6.	a
7.	d
8.	c
9.	b
10.	d
11.	a
12.	c
13.	b
14.	b
15.	d

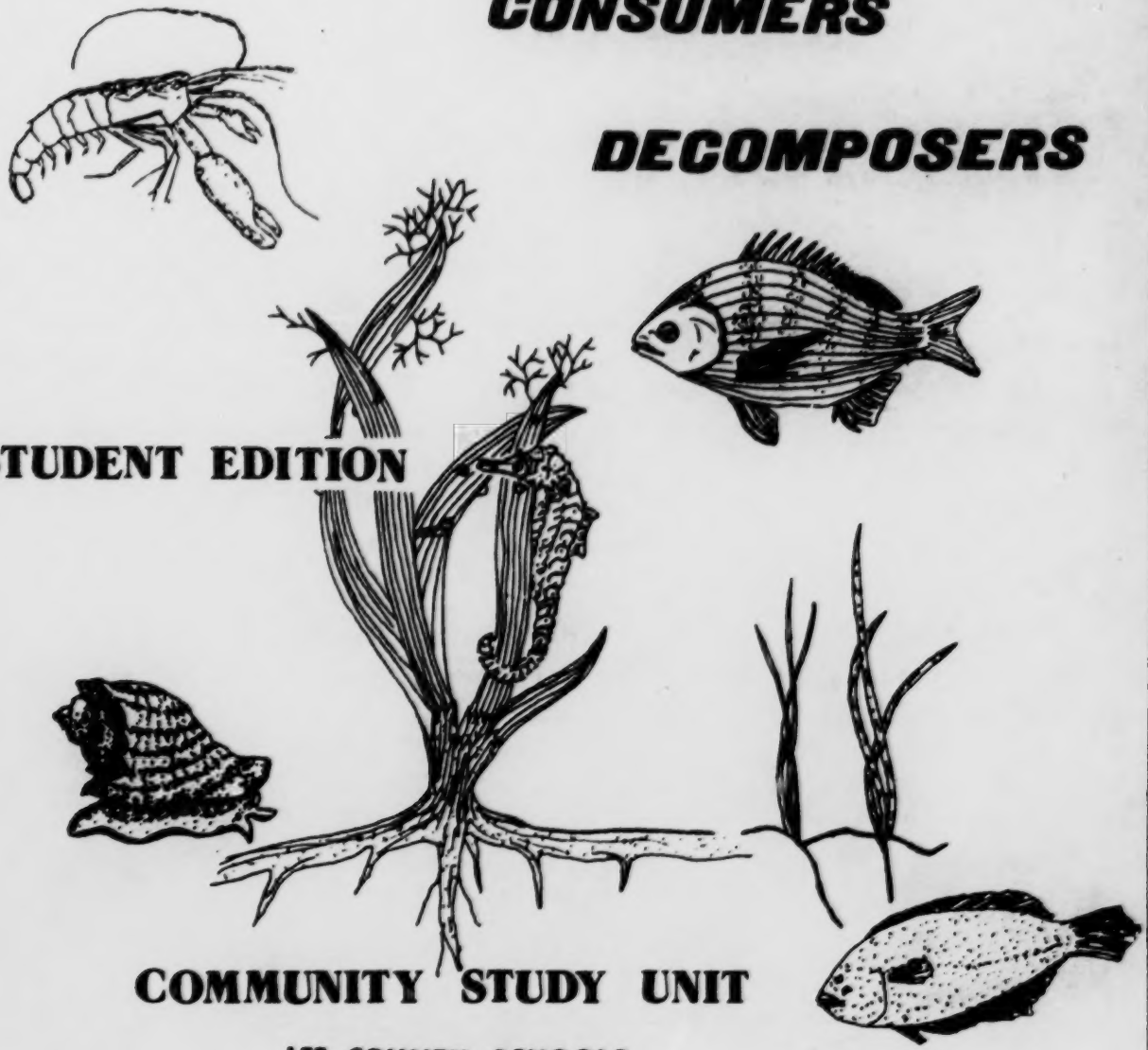
NAME

MUDFLAT GUIDE

PRODUCERS

CONSUMERS

DECOMPOSERS



STUDENT EDITION

COMMUNITY STUDY UNIT

LEE COUNTY SCHOOLS

GRADE 3

The Mudflat

A mudflat is...

a community of plants, animals, and non-living things.
The community is covered with saltwater at high tide.

We will be trying to find...

producers, consumers, and decomposers that live here.
We will learn how they are related in the food web.

What we will find...

will depend on the tide, on the wind, on the temperature,
but most importantly on how hard you look.

A tide is...

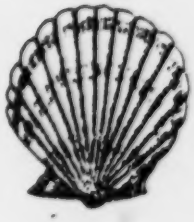
a change in how deep the water is along the shore.
We have tides because the sun and moon pull on the earth.

page 4

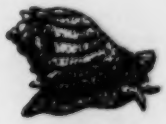
page 5

page 6

page 8



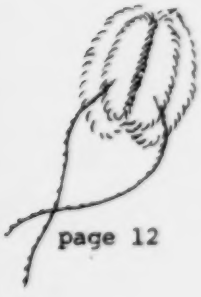
page 9



page 10

page 14

page 11



page 12

page 13

page 15

pages 16 - 17

page 18

Catch something like this?
Look inside for more!

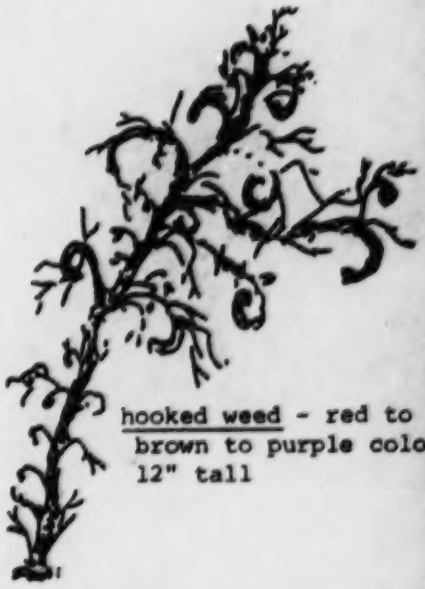
PRODUCER SECTION

A producer is
a living thing that makes its own food
using energy from the sun.

Algae

graceful red weed - red to brown color - 20" tall

chenille weed - brown to cream color - 4" tall

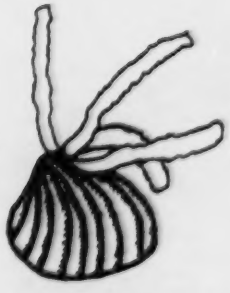


hooked weed - red to brown to purple color - 12" tall

prickly weed - tan to green to brown color - 10" tall

sea lettuce - green - 8" tall

flat fingers - brown to green color - 14" tall
or - red - 6" tall



mermaid's hair - green - tube like - attaches to shells - 3" tall

Algae - grow on the mud bottom and are found floating.

Grasses

turtle grass - grows farther from shore in shallow holes - 12" tall, ½" wide

manatee grass - grows far from shore in deep water - 12" tall

shoal grass - grows near shore, uncovered at very low tides - 5" tall

Grasses - grow in mud and sand on the bottom.

41

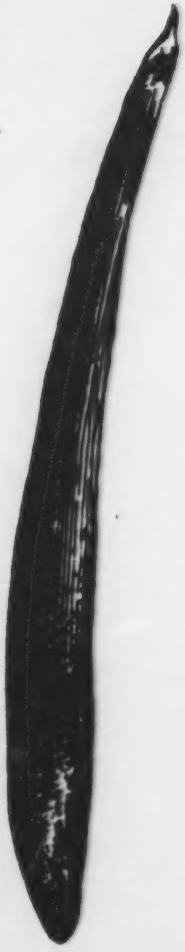
Seeds and Seedlings

Australian pine-
3/4" round

black mangrove - 3/4" bean

white mangrove - 3/4" tall

buttonwood - 3/4" round



red mangrove - 10" tall

Seeds and seedlings - grow on the shore and not in the water.
They may be found floating.

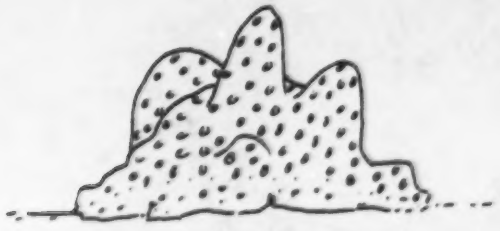
CONSUMER SECTION

A consumer is

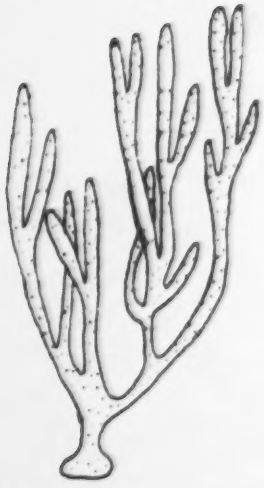
a living thing that cannot make its own food

but must eat other plants and animals to get its energy.

Animals That Look Like Plants



sulphur sponge - yellow - 10-12" across



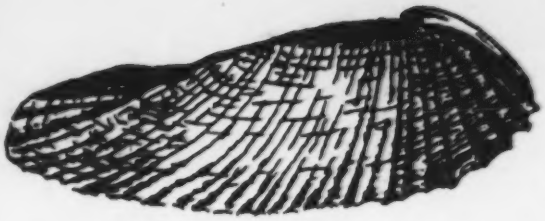
sea whip - a soft coral - bright colors - 15" tall

dead man's fingers - reddish-brown color - 10-15" tall

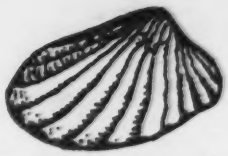
Animals That Look Like Plants

Colonial animals - have many individuals living together in one large group. These animals eat microscopic plants and animals.

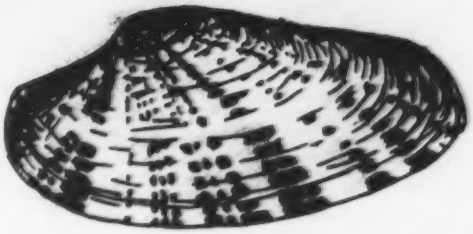
Two-Shell Animals



angel wing - up to 8"



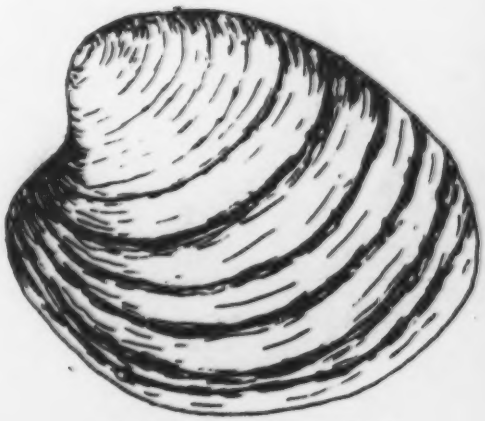
broad-ribbed cardita - 1-1½"



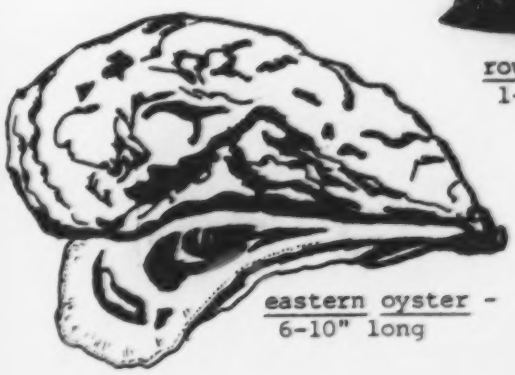
sunray venus - up to 5"

elegant dosinia - 1¼"

rough scallop - 1-3"



hardshell clam - 3-5"



eastern oyster - 6-10" long

Are shells alive? No. They are the home for an animal. The animal makes its shell. They must make it bigger as the animal grows. Shells are evidence of animals who live here.

Can you find a live two-shell animal? Look for one with the two shells still tightly closed.

Two-Shell Animals - (bivalves, like clams) eat microscopic plants and animals.

One-Shell Animals

NOTE: If you see claws sticking out of a shell, you may have a hermit crab inside a snail's old shell.

Plant eaters - herbivores

fly-specked cerith
3/4-1"

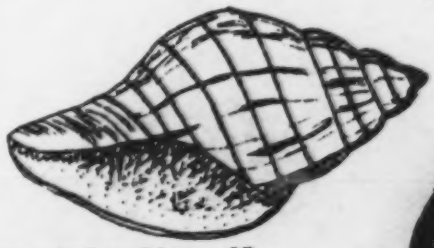
bubble shell - ¼-1"

periwinkle - 1-1¼"

Animal-eaters - carnivores

kings crown - 2-4"

fighting conch - 3-4"



banded tulip - 3"

cat's eye - 1-3"

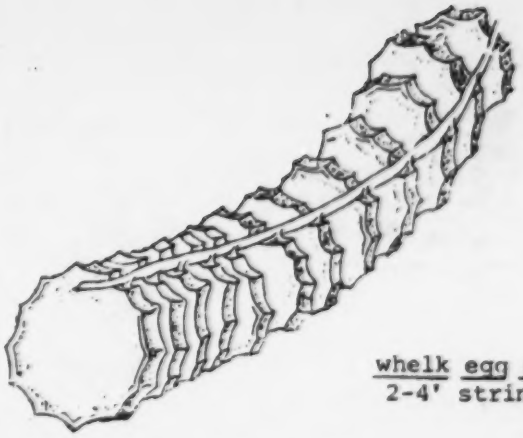
lightning whelk - 7-10"

Plant eaters - herbivores

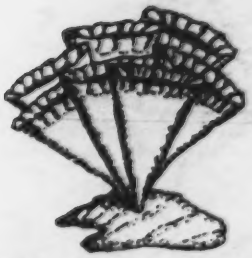
Animal-eaters - carnivores

One-Shell Animals

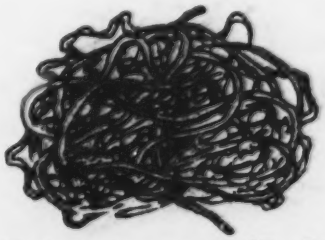
Eggs and Egg Cases



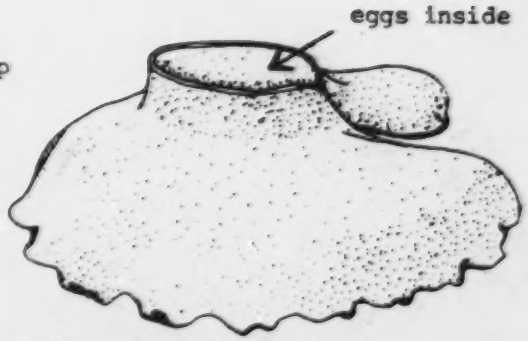
whelk egg case - 1" across
2-4' strings



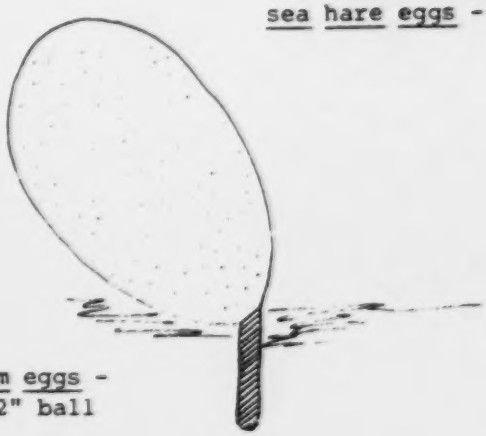
tulip egg case - 1" tall



sea hare eggs - 2-3" clump



cat's eye egg collar -6-8" across

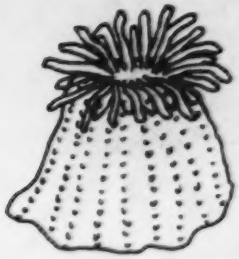


worm eggs -
1-2" ball

Eggs and Egg Cases - are laid by an animal.

Soft-Bodied Animals

comb jelly - eats fish, crabs, shrimp - ¼-2"

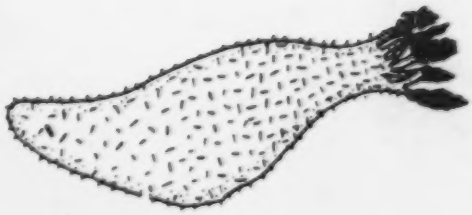


sea anemone - eats small plants and animals or dead food found in the water - 1"

decorator worm tube - eats small animals found in the water - 3-5" long, ½" across

lugworm pile - eats dead and decaying plants and animals found in the sand - 1-4"

sea squirt - squirts water - eats microscopic plants and animals - ¼-2"



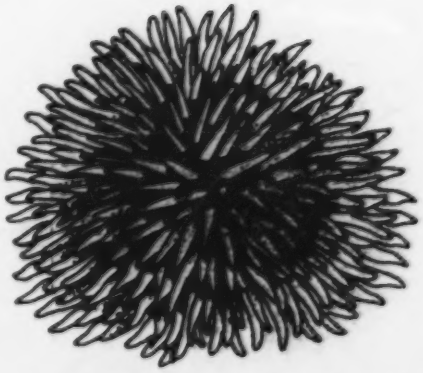
sea cucumber - eats dead and decaying plants and animals found in the sand - 3-5" long

sea pork - hard wax-like lump - eats microscopic plants and animals - 2-6" and larger

Soft-Bodied Animals

Prickly Animals

brittle or serpent star - body less than ¼" - arms 2" long



sea urchin - average 2" high and 4" wide

starfish - up to 15" across

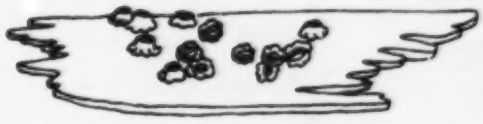
Prickly Animals - craw over mud, sand, rocks, and logs on the bottom. These animals eat living plants and dead and decaying plants and animals.

Shrimp and Relatives

amphipod - to ½" long

isopod - 3/4-1" long

*eat dead and decaying plants and animals

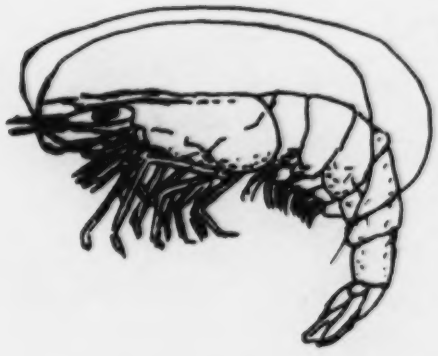


barnacle - lives attached to shell, log, or pier - up to 2" across

broken-back shrimp - 1" long

grass shrimp - green - 1-1½" long

pistol shrimp - eats fish - ½-3" long



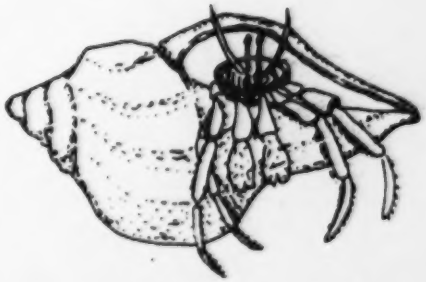
common shrimp - clear or gray color - ½-8" long

Shrimp and Relatives - (crustacea) most eat microscopic plants and animals.

Crabs

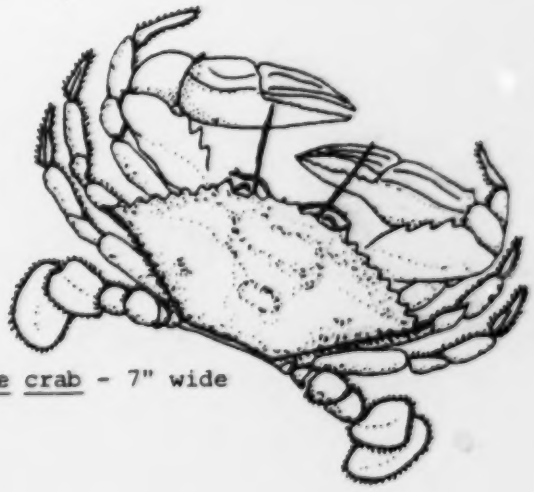
fiddler crab, (male pictured - females have 2 little claws) - lives on the shore - 1"

horseshoe "crab" - not a true crab; related to spiders! - up to 20" long



hermit crab - lives in "borrowed" shell - 1-2"

stone crab - hides inside things - 5-8"



blue crab - 7" wide

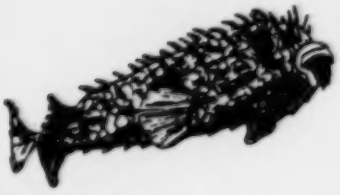
spider crab - 3"

Crabs - eat dead plants and animals and catch live fish.

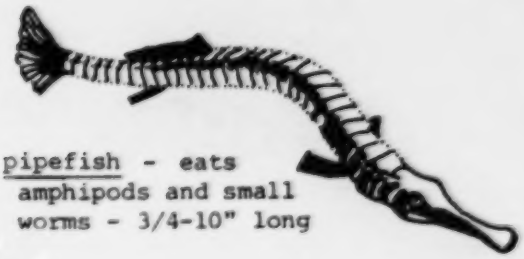
file fish - eats algae, other plants, and some worms and barnacles - 1-6" long

pinfish - eats small fish, crabs, and worms - 1-8"long

smooth puffer - eats barnacles, small snails, crabs, shrimp, amphipods, & worms - 1-12" long



spiny boxfish - eats barnacles, small snails, crabs, shrimp, amphipods, and worms - ¼-8" long



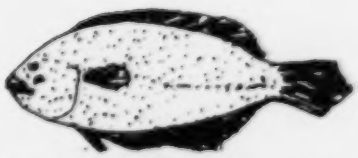
pipefish - eats amphipods and small worms - 3/4-10" long

seahorse - eats small worms and amphipods - ¼-2" long

goby - eats small crabs, shrimp, and amphipods - ¼-2" long

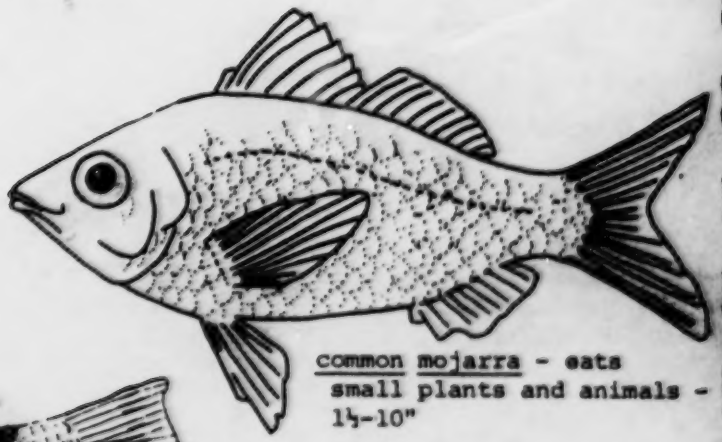
lizard fish - eats small fish, crabs, shrimp, and worms - 1-16" long

bigheaded sea robin - eats fish, crabs, amphipods, shrimp, worms, and some small plants - 1-12" long



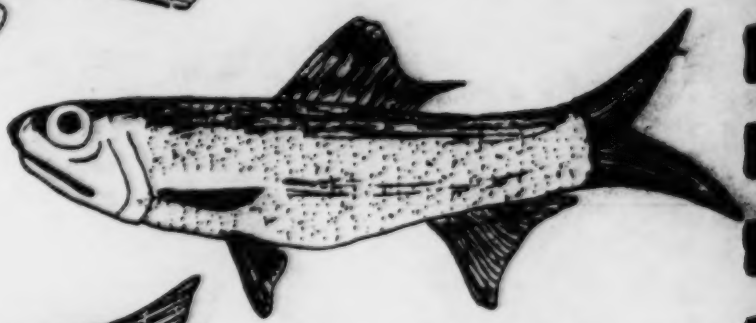
gulf flounder - eats plants, worms, shrimp, and small fish - 1-30" long

More Fish

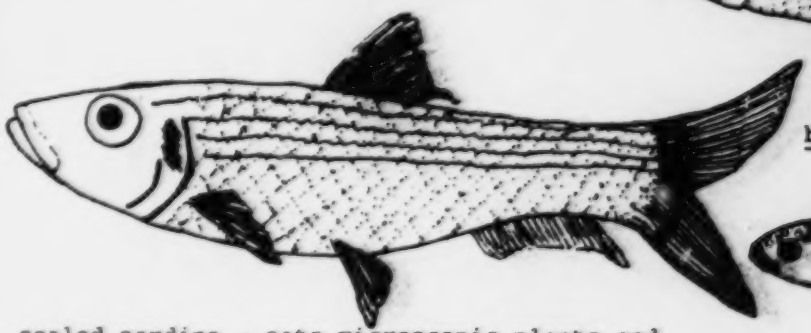


common mojarra - eats small plants and animals - 1½-10"

gulf whiting - eats shrimp, crabs, amphipods, and worms - 1-20"

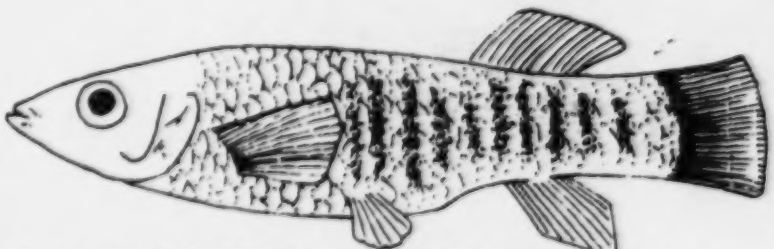


bay anchovy - eats microscopic plants and animals - 1-6"

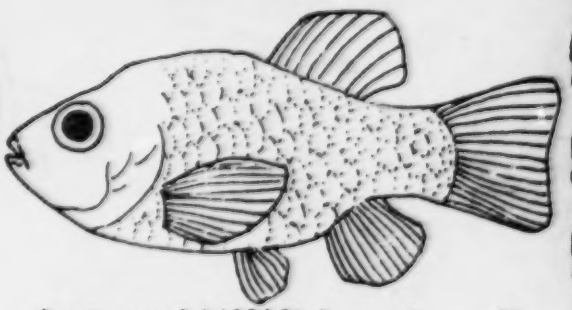


scaled sardine - eats microscopic plants and animals - 1-6"

tidewater silversides - eats small worms and other animals - 3/4-3"



long-nosed killifish - (wide flat back) - eats small animals and plants - ½-6"



short-nosed killifish - eats small animals and plants - 3/4-4"

Birds

gull - 15½-17"

tern - 13-16"

osprey - 21-25"

shorebird - 14-17"

egret - 22-38"

pelican - 45-54"

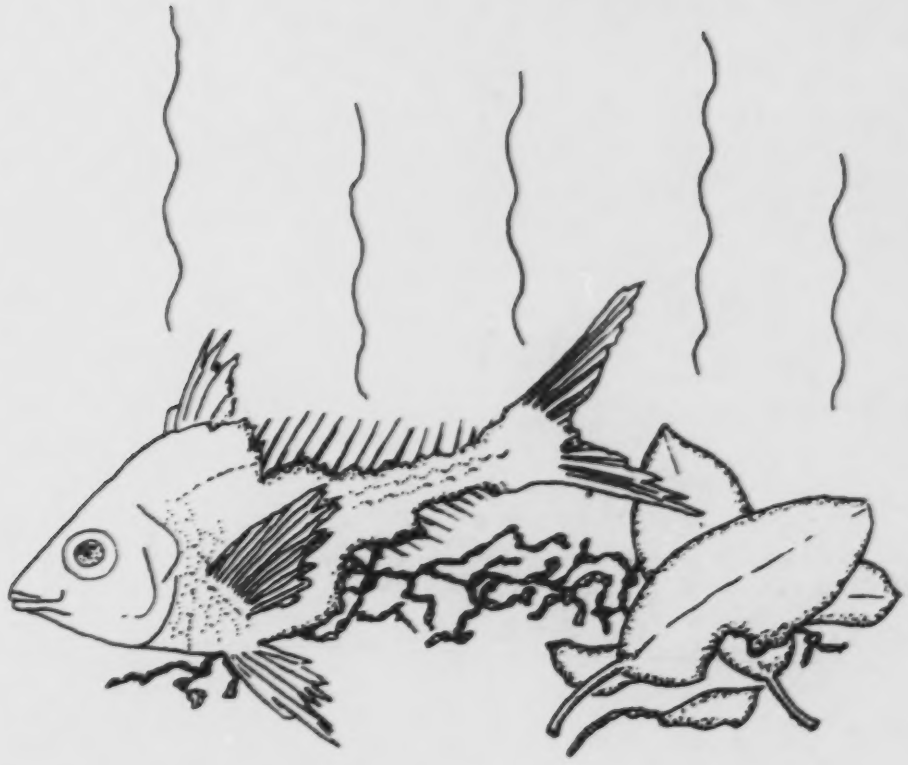
heron - 20-50"

Birds - eat small fish, shrimp, clams, crabs, and some decayed plants and animals.

DECOMPOSER SECTION

A <u>decomposer</u> is
a living thing that breaks down
the remains and wastes of plants and animals.

Decomposers



Since most decomposers are microscopic, we will not be able to see many of them at the mudflat today. We can look for evidence that they are here. Find a dead animal or plant along the shore. Smell it.

MUDFLAT TALLY SHEET

PRODUCERS

Algae	Grasses	Seeds/Seedlings

CONSUMERS

Sponges	2 Shell Animals	1 Shell Animals	Eggs & Egg Cases

Soft-Bodied Animals	Prickly Animals	Shrimp and Relatives

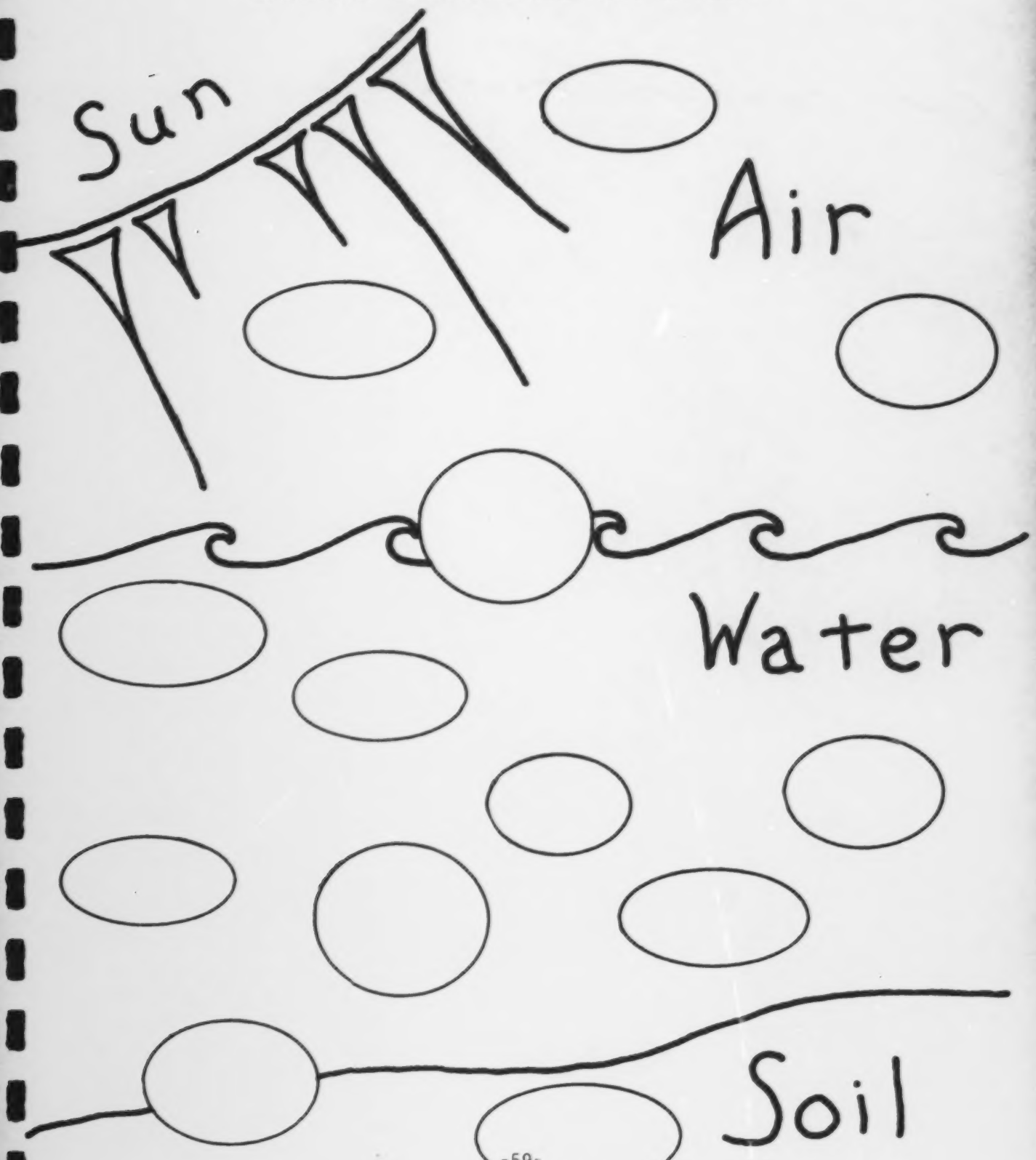
Crabs	Fish	Birds

DECOMPOSERS

Bacteria	Fungi

Web of Life Worksheet

Listen for directions from your teacher.



Can you tell what these are?

Scientific Names

Page & Title	Common Name	Scientific Name
p. 4 - Algae	shaggy wood	Sargassum sp.
	beaded wood	Fucus sp.
	prickly wood	Acanthophora sp.
	sea lettuce	Ulva sp.
	graceful red weed	Gracilaria sp.
	mermaid's hair	Nemastoma sp.
	fleur fingers	Halimeda sp. or Udotea sp.
p. 5 - Grasses	turtle grass	Thalassia testudinum
	manatee grass	Cymodocea (Syringodium filiforme)
	shoal grass	Halodule wrightii
p. 6 - Seeds/ Seedlings	Australian pine	Casuarina equisetifolia
	red mangrove	Rhizophora mangle
	black mangrove	Avicennia nitida/A. germinans
	white mangrove	Laguncularia racemosa
	buttonwood	Conocarpus erecta
p. 8 - Animals That Look Like Plants	sulphur sponge	Cliona celata
	sea whip	Leptogorgia virgulata
	dead man's fingers	Chalina arbuscula
p. 9 - Two Shell Animals	angel wing	Cyrtopleura costata
	broad-ribbed cardita	Cardita floridana
	rosary venus	Macrocallista nimbosa
	elegant dosinia	Dosinia elegans
	rough scallop	Aequipecten muscosus
	hardshell clam	Mercenaria campechiensis
	eastern oyster	Crassostrea virginica

Page & Title	Common Name	Scientific Name
p. 10 - Shrimp Relatives	ghost	Upogebia [illegible]
	lobster	Panulirus argus
	mantis shrimp	Squilla [illegible]
	brown shrimp	Penaeus aztecus
	grass shrimp	Palaemonetes vulgaris
	pistol shrimp	Alpheus heterochaelis
	common shrimp	Penaeus setiferus
p. 15 - Crabs	fiddler crab	Uca pugilator
	hermit crab	Clibanarius vittatus
		Petrochirus diogenes
	stone crab	Menippe mercenaria
	blue crab	Callinectes sapidus
	spider crab	Mithrax spinosissimus
	horseshoe "crab"	Limulus polyphemus
p. 16 - Fish	file fish	Monacanthus ciliatus or Stephanolepis hispidus
	pinfish	Lagodon rhomboides
	smooth puffer	Lagocephalus laevigatus
	spiny boxfish	Chilomycterus schoepfi
	gulf pipefish	Syngnathus scovelli
	lined seahorse	Hippocampus erectus
	crested goby	Lophogobius cyprinoides
	lizard fish	Synodus foetens
	gulf flounder	Paralichthys lethostigma
	bighended sea robin	Prionotus scitulus

Page & Title	Common Name	Scientific Name
p. 10 - One Shell Animals	fly-specked earth	Caecum pulchellum
	bubble shell	Bulla occidentalis/B. elongata
		Bulla occidentalis
	cancellate periwinkle	Littorina angulifera
	kings crown	Philonexus dormitor
	banded tulip	Fasciolaria hunteria
	fighting conch	Strombus pugilis
	onto eye	Polinices duplicatus
	lightning whelk	Busycon contrarium
p. 11 - Eggs and Egg Cases	whelk	Busycon sp.
	tulip	Fasciolaria sp.
	sea hare	Bursatella leachi
	onto eye	Polinices duplicatus
	worm	unknown
p. 12 - Soft Bodied Animals	comb jelly	Pleurobrachia bachei
		Beroe sp.
		Thalassocalyce inconstans
	sea anemone	Paranthus rapiformis
	decorator worm	Diopatra cuprea
	tapeworm	Arenicola cristata
	sea cucumber	Thyonella floridana
	sea squirt	Styela partita/S. plicata
	sea pork	Amaroucium stellatum
p. 13 - Prickly Animals	serpent star	Ophioderma brevispina
		Ophiothrix angulata
	sea urchin	Lytechinus variegatus
	starfish	Astropecten duplicatus
		Luidia clathrata

Page & Title	Common Name	Scientific Name
p. 17 - Fish	common mojarra	Eucinostomus gula
	gulf whiting	Menticirrhus littoralis
	bay anchovy	Anchoa mitchilli
	banded sardine	Harengula pensacolae
	tidewater silverside	Menidia beryllina
	long-nosed killifish	Fundulus similis
	short-nosed killifish	Fundulus heteroclitus
p. 18 - Birds	gull (laughing)	Larus atricilla
	tern (common)	Sterna hirundo
	osprey	Pandion haliaetus
	white-faced ibis	Plegadis chihi
	egret (American)	Casmerodius albus
	heron (great blue)	Ardea herodias
	pelican (brown)	Pelecanus occidentalis

GLOSSARY

algae - small green plants that live in the water and make their own food.

bacteria - microscopic organisms that are primarily decomposers.

carnivore - a consumer that eats other animals.

colony - a group of the same kind of plants or animals living or growing together.

community - all of the plants and animals and non-living things that exist together in the same place.

consumer - a living thing that is not capable of making its own food but eats plants and animals.

cycle - a repeating sequence of events that has no beginning and no end.

decay - to rot or break down into smaller parts.

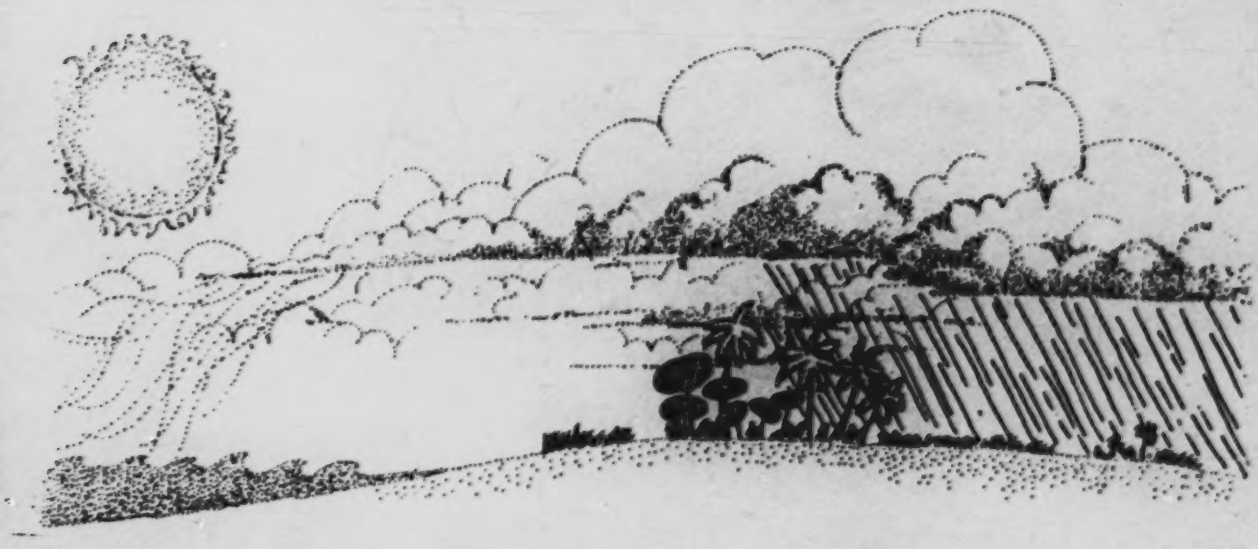
decomposer - a living thing that breaks down the remains and wastes of plants and animals.

dependent - needing or relying upon other things.

diet - the things that an animal eats.

food chain - a simple way of showing how producers, consumers, and decomposers are connected.

food web - a number of food chains that are interconnected.



fungi - simple, non-green plants that are primarily decomposers.

herbivore - a consumer that eats plants.

matter - the stuff of which plants, animals, and rocks are made.

microscopic - too small to be seen without magnification.

mudflat - a community of plants, animals, and non-living things that is covered with saltwater at high tide and often exposed to air at low tide.

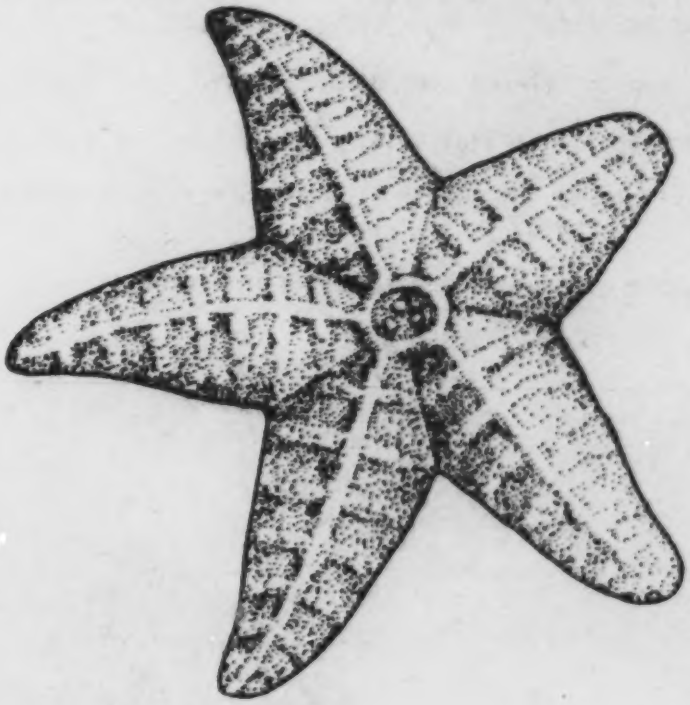
omnivore - a consumer that eats both plants and animals.

organism - a living thing.

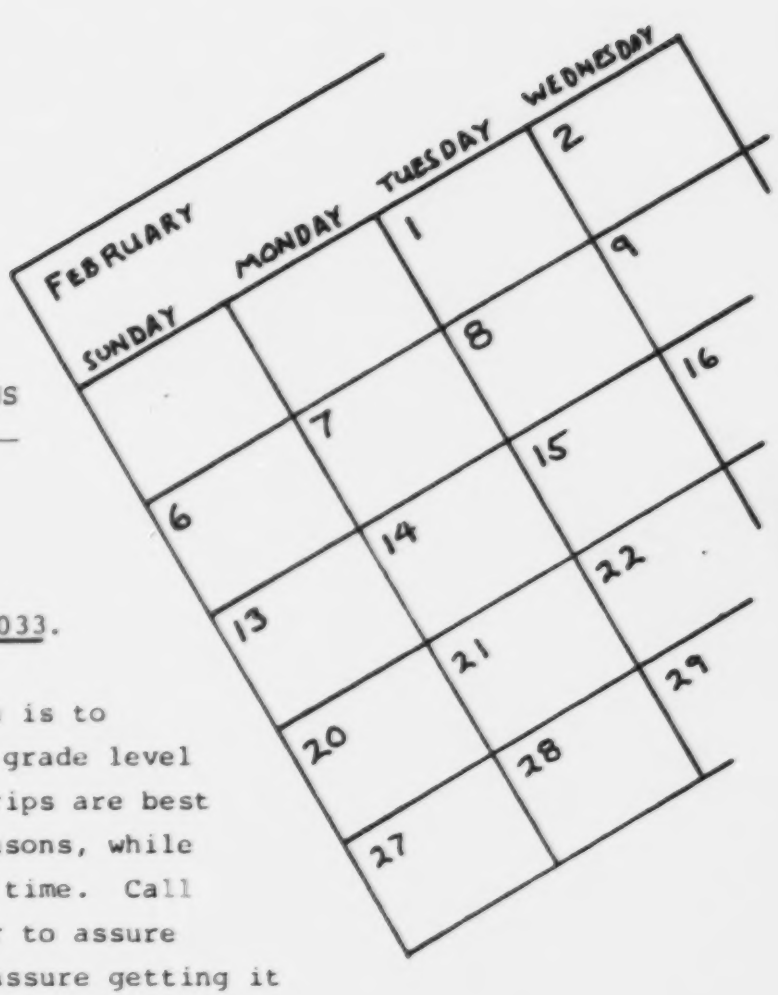
producer - a living thing that makes its own food using energy from the sun.

related - connected.

tide - a change in how deep the water is along the shore.



SCHEDULING CONSIDERATIONS



To arrange an EE/IDS community study trip, please call us at 275-3033.

Our first recommendation is to use one of the standard grade level trips. Some of these trips are best done during specific seasons, while others work well at any time. Call early in the school year to assure getting a trip, and to assure getting it at the most appropriate time.

If the standard trip does not meet your needs, a custom trip could be designed. This would necessitate a meeting with EE/IDS staff to identify goals, design pre- and post-trip activities, and create a meaningful field experience. Any custom trip should have at least the impact of the standard trips. It should also mesh closely with the on-going curriculum. The classroom teacher and EE/IDS staff would share development responsibilities.

> CALL 275-3033 <

PARENT PERMISSION FORM

As parent or legal guardian, I hereby grant permission for _____ (student's name) to take part in a field trip to the coastal mudflats at _____ (site) on _____ (date).

I understand that this trip is an integral part of the ongoing school curriculum, and that the students will be studying the web of life. On the trip the students should expect to get wet to their waists. I'll be sure that my child wears clothing and tie-on shoes that can get wet.

_____
(signature of parent or guardian)

_____
(date)

_____
(emergency phone number)

This publication is one of the teaching units in the community studies series developed by the Lee County Schools, Florida.

The community study series is designed to assist teachers and students in learning through experience how the Lee County communities function, and the rights and responsibilities each of us shares in maintaining a healthy, productive community.

By systematically experiencing our community, students tend to see the pattern that connects the natural and cultural environment, and how each of us is an independent agent for change.

The community study instructional units have been field tested by teachers and students.

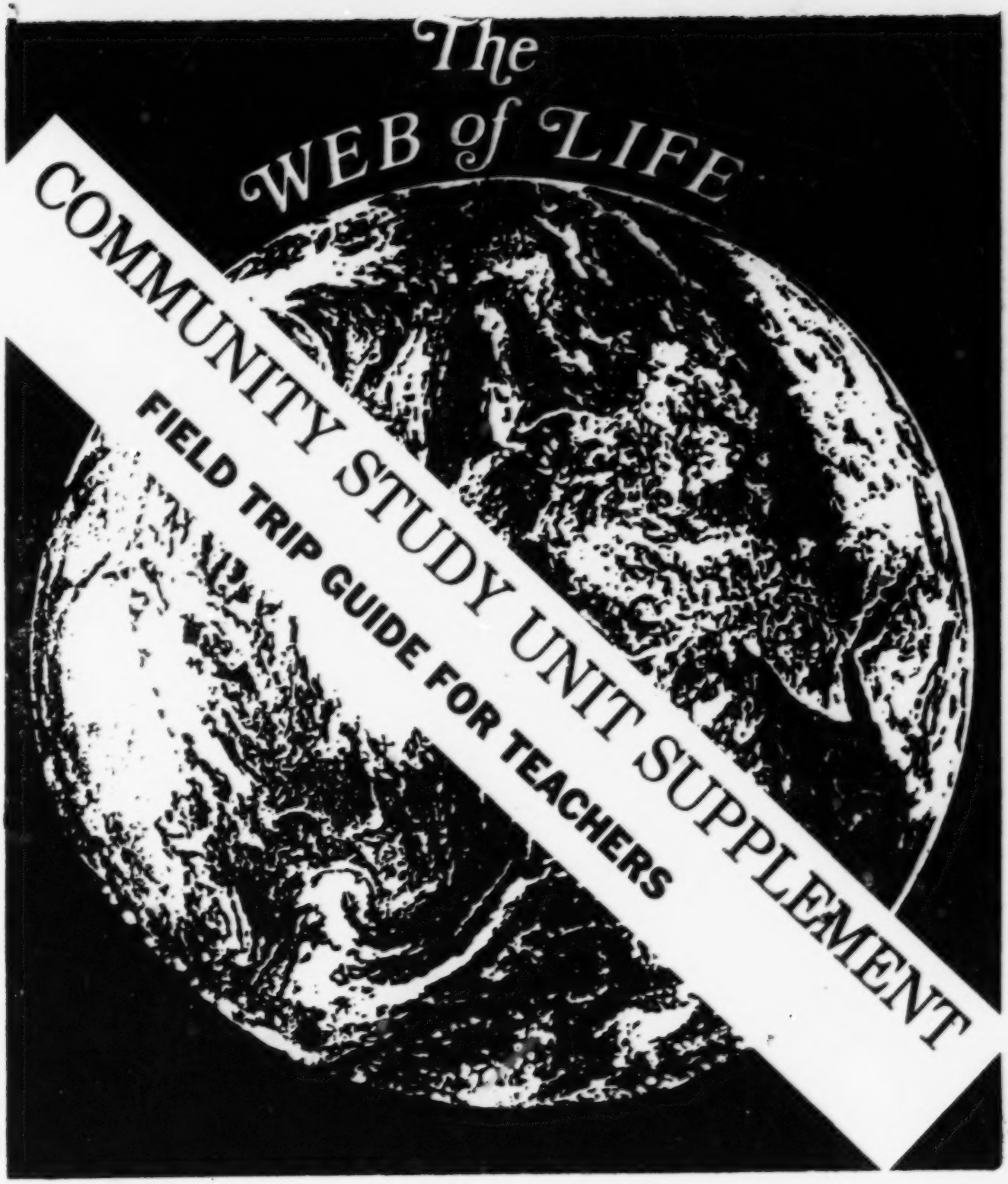
All guides are COPYRIGHTED. Full permission is granted for non-profit educational use.

The units have been produced by the staff of the DEPARTMENT OF INSTRUCTIONAL DEVELOPMENT SERVICES AND ENVIRONMENTAL EDUCATION of Lee County School system:

Bill Hammond	Director
Jo Ellen Kessler	Coordinator
Craig Hortman	Resource Teacher
Rick Tully	Resource Teacher
Keith Hanson	Resource Teacher
Neil Wilkinson	Resource Teacher
Cindy Bear	Resource Teacher
Brian Murphy	Resource Teacher
Tom Miller	Helping Teacher
Lynette Dean	Adv. County Staff Secretary
Deborah Bovee	County Staff Secretary

with special contributions from former IDS/EE staff members, Lee County teachers, district staff, students, and members of the community.

Lee County Schools
Instructional Development Services/
Environmental Education
2055 Central Avenue
Fort Myers, Florida 33901
813-275-3033



COMMUNITY STUDY UNIT

GRADE 3

LEE COUNTY SCHOOLS

CLASSROOM TEACHER GUIDE

TO

THIRD GRADE

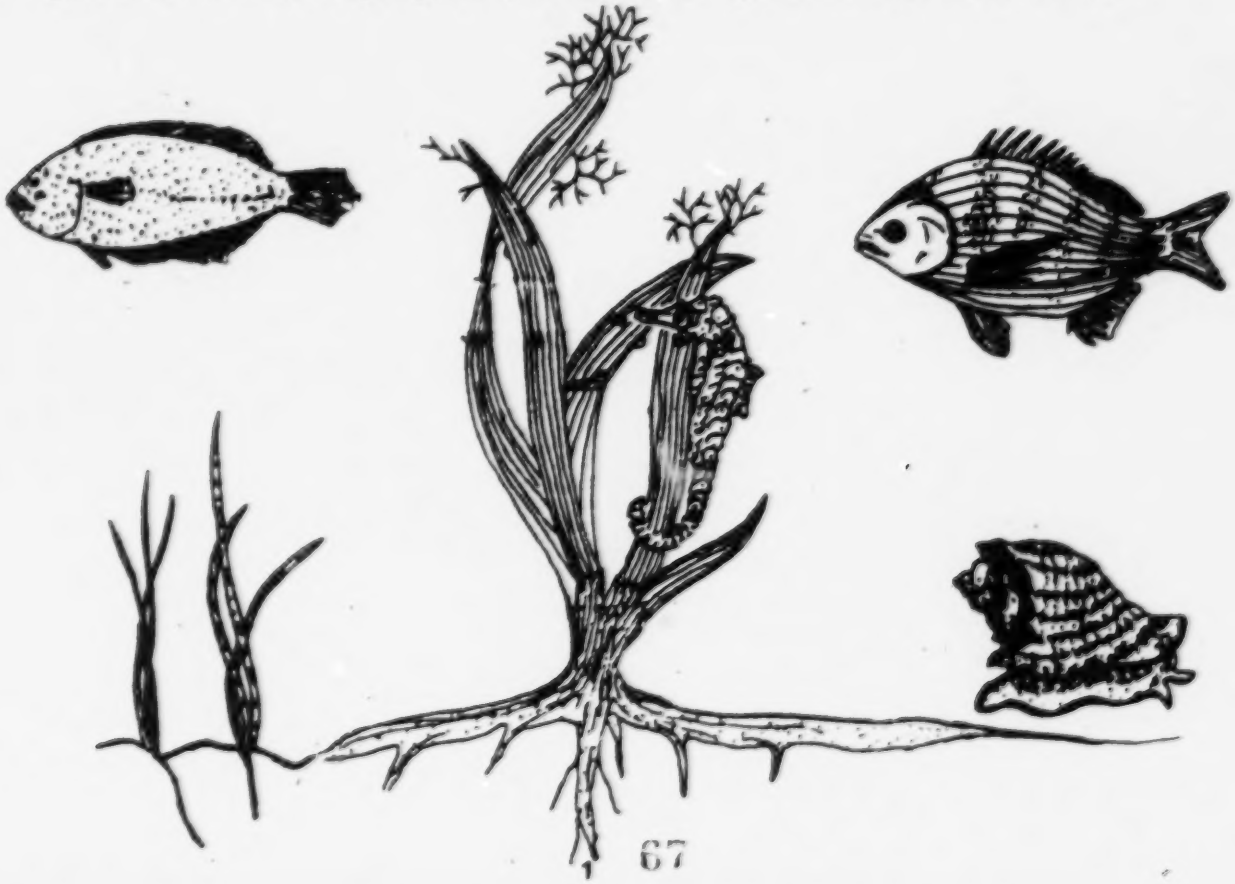
WEB OF LIFE FIELD TRIP

HOW TO USE THIS GUIDE

This field trip guide is written for the classroom teacher who is planning to lead an environmental education field trip without the assistance of an Environmental Education and Instructional Development Services (EEIDS) staff member. Please read this guide carefully. Note the safety precautions and equipment lists.

The activities are arranged in the sequence usually followed by EEIDS staff members. However, once you have read this guide and considered the needs of your class, you may choose to rearrange, add, delete or adapt activities to fit your situation. There are more activities described here than you will need. Consider them all as options from which you can select the most appropriate activities for your particular class.

In the event that several classes are at the mudflats at the same time, you should be prepared to adjust your schedule so that you are not all trying to use the same space at the same time.



EQUIPMENT

The following is a list of equipment and supplies you may need for this field trip. Some of them are optional. Some can be provided by EEIDS, while some must be provided by the school or teacher. The teacher is responsible for calling the Department of Environmental Education (275-3033) to arrange for pick-up and drop-off of borrowed equipment. Equipment should be clean and in working order when it is returned.

Can be provided by EEIDS:

Dip nets
Seines
Buckets
Clear plastic jars
Sorting trays
Magnifying lenses
Clipboards
"Animal Parts" cards

Should be provided by teacher:

Cooler with lunches/drinks/ice
Pencils
First aid kit
Blindfolds (optional)
Trash bags

PREPARATIONS FOR A SUCCESSFUL FIELD TRIP

Prior to the Trip

1. Carefully read all materials sent to you by the Department of Environmental Education and Instructional Development Services.

2. We highly recommend that you visit the field trip site yourself before taking your class. It will help you be more familiar with the area and any potential problems as well as with places for leading your activities.

3. Ask the Department of EEIDS for the slide/script program designed for your trip. It will help familiarize you and your students with the trip.

4. Prepare your students for the trip by doing the pre-trip activities in the teacher unit and by explaining to them what they should expect while on the field trip.

5. Call EEIDS if you have any questions regarding the field trip site or activities.

6. Find out if there are any students in your class with allergies, especially to insect bites or stings.

On the Field Trip

1. Good student behavior is as important on a field trip as it is in the classroom. Review with your students all the rules and policies for behavior and safety as well as the consequences for breaking those rules.

2. Demonstrate proper and safe use of all equipment and supplies used during the day.

3. Make sure students and adults always wear tie-on shoes during the trip.

4. Students must be well supervised at all times during the day.

Special Considerations for

THIRD GRADE

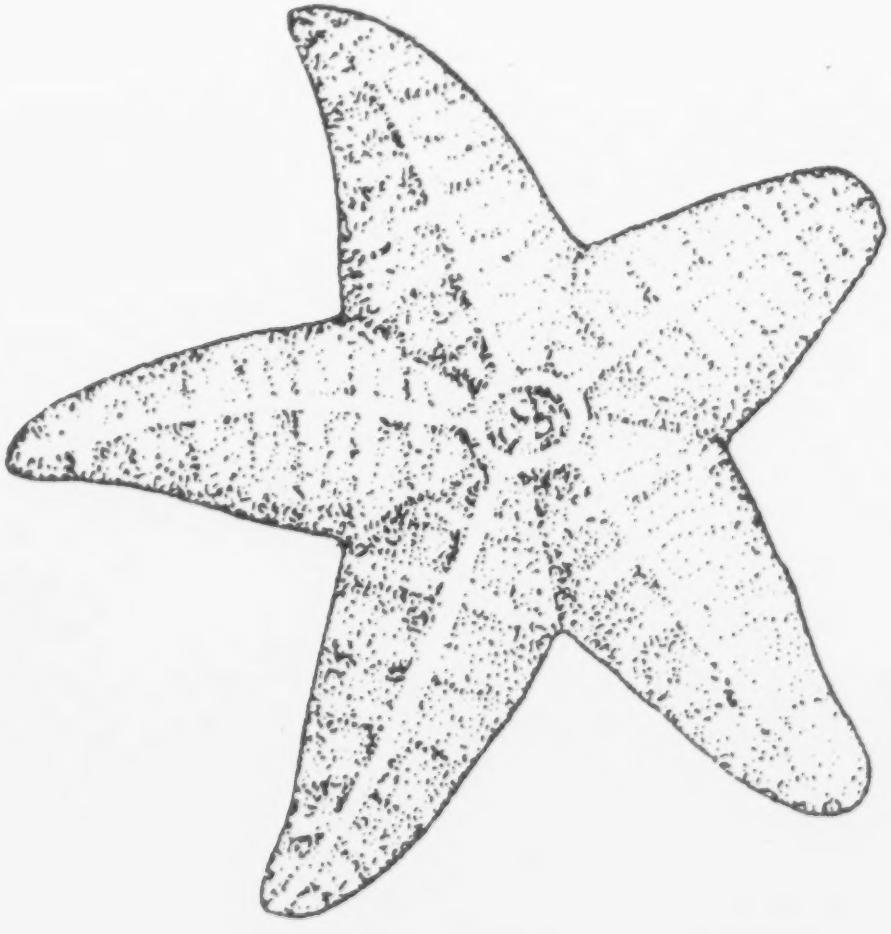
THE WEB OF LIFE

1. Demonstrate proper use and care of nets, seines, buckets, sorting trays, and any other equipment used on the trip.

2. **Swimming is not allowed on EE staff-led field trips. We recommend for your students' safety that you prohibit swimming as well.**

3. Because stingrays might be present have students shuffle their feet along the mudflat bottom to avoid stepping on them. Have students walk slowly rather than running in the water to avoid falling or slipping down.

4. Set specific boundaries for the students when they are in the water collecting.



BUS ORIENTATION

Have the Mudflat guides available for the students when they first arrive on the bus. Guides may be distributed as students board. Clipboards are usually not needed for this trip. Briefly outline for the students the kinds of things you will be doing on the trip to the mudflats. Tell them that you will be helping them, and that they will be helping you, find out as much as possible about the kinds of things that live at the mudflats. Tell them they will try to find out what lives there, what the animals eat, what eats them, how the animals get around, etc. Ask the students to define <u>community</u> for you. Restate and refine their definitions.

Be sure they understand that some communities have people living in them, but some do not. Stress the connection we all have to the mudflat community. The mudflats is a nursery ground for all kinds of animals - shrimp, crabs, clams, oysters, fish, etc.. Without the mudflats and the mangroves these animals would not be able to grow up. These small animals are the foods for many larger animals like pelicans, bigger fish, ospreys, herons, and egrets. Many people also enjoy eating these animals. Commercial fishermen and shrimpers also depend on these animals. Point out the picture on page 1 of the Mudflat guides. This drawing shows the students what the mudflats might be like. The grasses grow under water and many of the animals live under the mud as well as in the water.

Prior to the bus departure, review the following school bus rules with the students:

1. Remain in seats.
2. Keep everything inside the windows.
3. Talk softly.
4. No eating or drinking on the bus.

DURING THE DRIVE TO THE MUDFLATS

Have the students read the first page of the mudflat guide during the bus ride. This will help them understand why they are going on the trip, and what they will be doing at the mudflat. Also tell them to study the entire booklet, looking at the pictures, and reading the introductions and definitions, so they will become familiar with the kinds of things you will be finding when you get to the mudflats.

ARRIVAL AT THE MUDFLAT

The best and most accessible site for this trip is at Punta Rassa. There is plenty of parking space in the public parking area on the south side of Summerlin Road just before the toll booths at the Sanibel Causeway. Tell the students that this is the area where you will be doing your collecting, but before you get off the bus read the following audience participation story.

AUDIENCE PARTICIPATION STORY

You will be telling them a story in which they all will be playing parts. Assign the following parts to four groups of students (add appropriate actions if you desire):

1. "shine, shine, shine!"
2. "grow, grow, grow!"
3. "munch, munch, munch!"
4. "chop, chop, chop!"

Assign a final part to yourself or any chaperons:

5. "Please pass the ketchup."

Practice each part with the groups and instruct them to be prepared to say their part when you point to them during the story.

"FROM SUNSHINE TO SONNY'S"

"One day, a farmer woke up, got out of bed, and walked over to the window. He looked outside and noticed that the sun was already shining (shine, shine, shine) brightly. Opening the window, he could smell the sweet smell of fresh grass growing in the fields nearby (grow, grow, grow). Out in the pasture the farmer's cow was having her breakfast (munch, munch, munch) of fresh grass that was growing (grow, grow, grow), in the warm sunshine (shine, shine, shine). The farmer had raised this cow for three years now, and today he was going to take her to the market (chop, chop, chop). The energy of the sun (shine, shine, shine,), that was used by the grass (grow, grow, grow), that was eaten by the cow (munch, munch, munch), was going to be turned into hamburger (chop, chop, chop)! So the next time you say, ("Please pass the ketchup.") don't forget to thank the cow (munch, munch, munch), and don't forget to thank the grass (grow, grow, grow), and don't forget to thank the sun (shine, shine, shine)"

After telling the story, diagram the story on a large piece of paper or poster board, with the students helping you remember all the characters. Ask the students to tell you the word for the thing that comes from the sun, goes through the entire story, and is the thing that all parts of the story need to live (ENERGY). Draw large arrows on the diagram to show the pathway energy takes as it goes through the characters in the story. Using the characters in the story, introduce (or review) the terms producer and consumer. Discuss each term with the students asking them for examples. You might have the students think of these two groups as "makers" and "eaters".

At this point, tell the students you forgot a character in the story. A rabbit was also out in the pasture eating the grass and one day the rabbit died. Ask the students to tell you what they think will happen to the rabbit after it dies. What will happen to the energy in the rabbit? Discuss decomposition and decomposers.

Tell the students that, while there are no cows, rabbits, or the kind of grass you might find in a pasture at the mudflat, there are producers, consumers, and decomposers. That is what you will be looking for during the day.

THE COLLECTING

Outside the bus, divide the class into five or six groups of four or five students each. You may wish to have one adult accompany each group of students while collecting. Tell them the importance of staying with their group. Distribute dip nets evenly among the groups and give each group one bucket. Remind the students that the living things caught under water must be placed quickly into the bucket with water in it. Instruct the students to collect, with their nets and buckets, as many different kinds of living things as they can. Demonstrate the use of the dip nets. They don't work well if you try to catch specific fish or crabs. The nets are most effective when pushed ahead or dragged behind while slowly walking in the water. Keep the net on the bottom while taking 10 - 20 small steps. Pull the net up carefully so everything in the net doesn't swim out. Search through the mud in the net for living things. Tell them that you will be wandering from group to group to help them if they need it. Also tell them that you will call them all together when they have had enough time to make a good collection - about 30 minutes to an hour. Caution students to handle nets carefully so they will not accidentally hit another student with the handle. Have the students place their hands on their waists so they know that they are not to go any deeper than this point. Also remind them that everyone is to keep their shoes on all day.

THE ANALYSIS

Before calling the class back to shore, draw a circle or semi-circle in the sand and place the plastic sorting trays filled with clean water inside the area. If it is hot, try to make the circle in the shade. Call the students to the shore, having them rinse their nets and put them near the bus. Ask them to gather around the semi-circle you have drawn, placing their buckets inside the area near the sorting trays. Have the students stand or sit so they can see the trays but are not blocking anyone else's view. Bring all of the buckets together and tell the students that you will be placing some of the items that were collected into the trays so everyone can see them better. Buckets should be shaded since hot water contains very little oxygen. If fish appear distressed, return them to the water immediately!

It will not be possible to share and discuss everything that has been collected. Tell the students that you will be talking about and passing around some of the most interesting things that were collected. The trays will be used to separate producers, consumers, and decomposers. Go through the buckets and place things into the appropriate trays. A small aquarium dip net is necessary to capture and sort the animals and plants. Have the students help you with the process of deciding if a specimen is a producer, a consumer, or a decomposer. Use small clear jars to hold specimens to be passed around the group. Lead the class in discussions of the ways the things you are passing around find their food, keep from getting eaten, move around in the water or mud, etc. Make repeated references to the way each thing fits into the food web of the mudflat. You will have no trouble collecting a large sample of producers and consumers. To discuss decomposers, look for evidence of their work - decaying leaves, dead fish or crabs, etc. Have the students smell these things. Also smell the mud and their hands. Tell the students that even though we can not see them most of the time, there are decomposers all around us and that one clue to their presence is the smell. Stress the importance of these unseen decomposers to the workings of the mudflat community. Without decomposers, there would be no recycling of material to make new things. Ask the students if they recycle aluminum cans or newspapers at home or school. Why do they recycle things? The decomposers do the same thing at the mudflat. They return energy to a form useful for new plants to use as food. After the students have had a chance to see the things in the trays, very carefully have them return the plants and animals to the water at least 25 feet from shore. Have students rinse out the buckets, trays, and nets and bring everything back to the bus to be loaded.

LUNCH

Lunch can be eaten at the picnic area on the Sanibel Causeway. There are restroom facilities and picnic tables. Have some adults accompany students to the restrooms and ask the students to wash their hands before they eat. If they have brought extra shoes to change into it may be done now. Be careful that no litter is allowed to blow away, and ask students to refrain from feeding the gulls and crows. The rocks at the shoreline can be very slippery and dangerous. Caution students against walking on them.

WRAP-UP ACTIVITIES

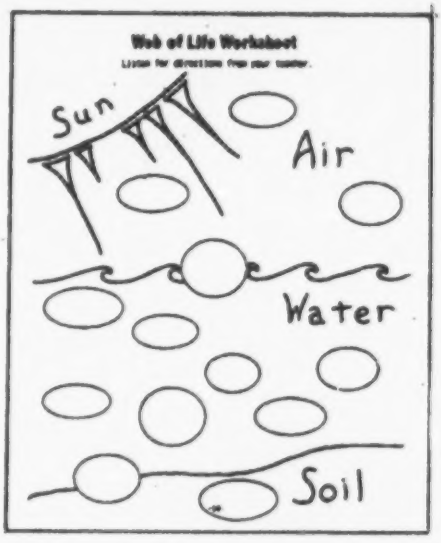
When the students have finished lunch there are a number of activities that can be done if time permits. These can be done at the picnic tables, on the bus, or back at school.

RECORDING YOUR COLLECTION

Haye the students get out their books and either pencils or crayons with which to write. Go through the mudflat book with them, one page at a time, and have them mark the things seen or collected at the mudflat. The tally page near the end of the book can be used to total the number of different kinds of things collected (i.e., four kinds of fish, three kinds of crabs, two kinds of grass, etc.).

THE FOOD WEB WORKSHEET

Ask the students to turn to the page in their books entitled "Web of Life Worksheet" so that they can draw the food web of the mudflat. Instruct them to write the name or draw a picture of an animal or plant seen today into each one of the circles on this page. The students may need to go back through the book to remember what they saw. When they have all the circles filled, have them draw a line between one circle and something that animal might eat to get energy to live. Continue to draw these lines between circles to show all the things that eat or are eaten by other things on the page. The descriptions in the book usually help the students find out what the animals eat. Be sure they show the producers getting their energy from the sun.



WHERE DID YOUR FOOD COME FROM?

Have the students draw two lines down the back cover of their books so they have three columns in which to work. At the top of the first column, have them write FOOD. At the top of the second column, have them write COMES FROM. At the top of the third column, have them write P.C.D. Now have the students go back and list all the food they had for lunch today under the first column. Instruct them to be specific (not "sandwich", but .rm 67 "peanut butter", "grape jelly", "bread", etc.). In the second column, have them write the source of each thing they ate. Milk comes from cows, bread comes from wheat plant, ham comes from pigs, etc. Finally, tell the students to decide whether the food they ate came from a producer (P), a consumer (C), or a decomposer (D), and write the first letter of this word in the last column. Don't forget that decomposers (such as yeast and bacteria) are important in the making of bread, cheese, yogurt, and other products.

ANIMAL PARTS

Divide the students again into their groups. Give each group a card which shows the picture of a mudflat animal or plant. Tell the groups that you will give them a few minutes to decide how they are going to form one of these animals or plants and act it out. The rest of the class will try to guess what animal or plant they are depicting. Explain clearly that the group will work together to form one plant or one animal rather than each person being a separate plant or animal.

DOLPHINS AND SQUID

This activity requires an open grassy area which can usually be found back at the school. It shows how a dolphin catches food using radar. Have the class form a large circle and hold hands. Choose a single student to be the dolphin and place him or her in the middle of the circle. Choose about six squid to be in the circle for the dolphin to catch. The rest of the class must hold hands to prevent anyone from leaving the circle. Tell the class that the dolphin is nearly blind, and must catch his food by sending out sounds that bounce off the squid, and listening for the sounds to come back. Place a blindfold over the eyes of the dolphin. Have him say "dolphin". When the squid hear "dolphin" they must immediately say "squid". The dolphin can then follow the sounds to chase the squid around the inside of the circle. When he touches a squid, the dolphin "eats" him, and the squid must join the students holding hands around the circle. These children making up the circle must remain <u>perfectly quiet</u> so the dolphin can hear the squid. Their role is very important as they mark the dolphin's "territory". The game continues until all squid have been "eaten".

WHALES AND DOLPHINS CHASE

Two lines of students face each other about 15 feet apart. Mark a boundary line in front of each line of students and about 20 feet behind each line of students. You will call out a variety of statements. If the statement is true, the dolphins (team 1) will turn and run to their safe boundary behind them being chased by the whales (team 2). If the statement is false, the whales turn and run for their safe boundary line chased by the dolphins. Any student tagged before they reach their boundary must join the opposite team.

Use statements which will be review for the field trip and Web of Life unit. Examples:

1. Consumers make their own food using energy from the sun. (F)
2. A blue crab is a consumer. (T)
3. Turtle grass is a type of decomposer. (F)

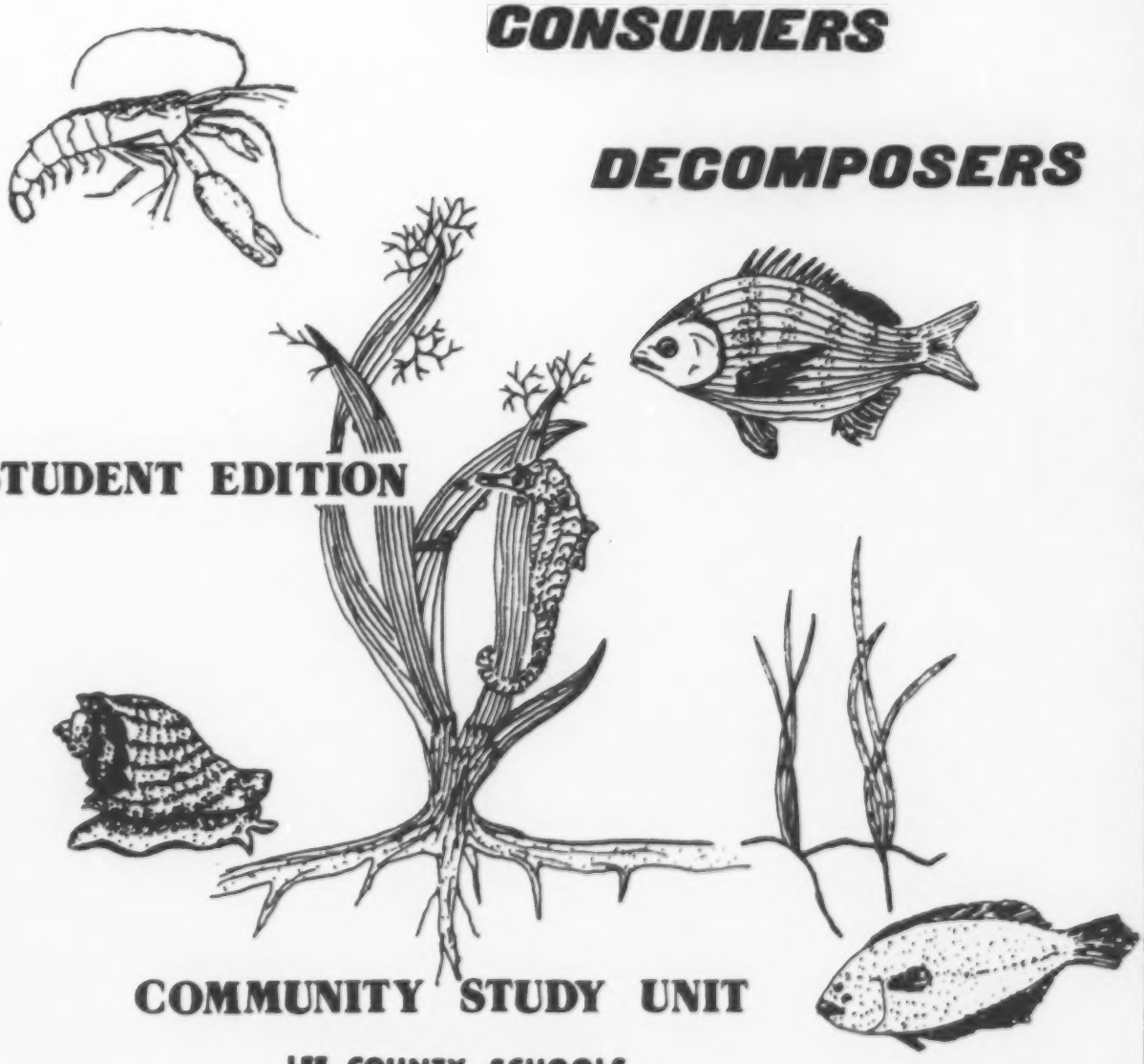
NAME

MUDFLAT GUIDE

PRODUCERS

CONSUMERS

DECOMPOSERS



STUDENT EDITION

COMMUNITY STUDY UNIT

LEE COUNTY SCHOOLS

GRADE 3

THE SCHOOL DISTRICT OF LEE COUNTY

2055 Central Avenue
Fort Myers, Florida 33901

Dr. James Adams
Superintendent

Dr. Charles Godwin
Assistant Superintendent of Instruction

Dr. J. P. Lutz
Director
Elementary Education

Mr. William Hammond
Director
Environmental Education and Instructional Development Services

The Mudflat

A mudflat is...

a community of plants, animals, and non-living things.
The community is covered with saltwater at high tide.

We will be trying to find...

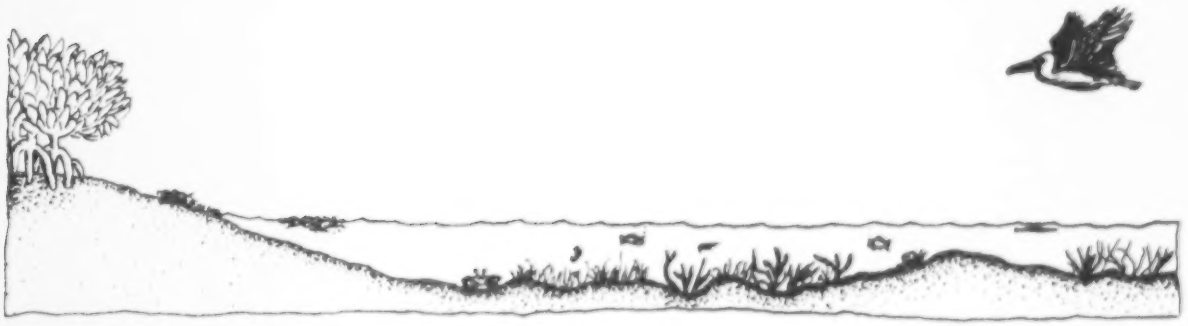
producers, consumers, and decomposers that live here.
We will learn how they are related in the food web.

What we will find...

will depend on the tide, on the wind, on the temperature,
but most importantly on how hard you look.

A tide is...

a change in how deep the water is along the shore.
We have tides because the sun and moon pull on the earth.



page 4

page 5

page 6

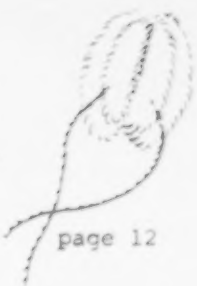
page 8

page 10

page 9

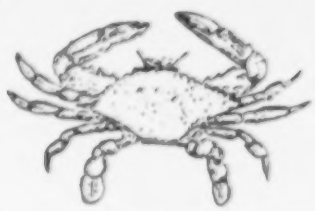
page 14

page 11

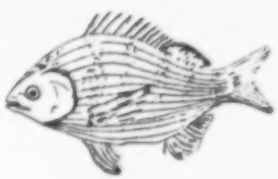


page 12

page 13



page 15



pages 16 - 17

page 18

Catch something like this?
Look inside for more!

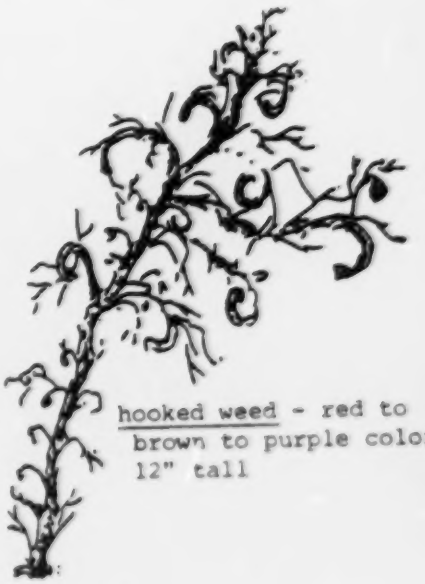
PRODUCER SECTION

A producer is
a living thing that makes its own food
using energy from the sun.

Algae

graceful red weed - red to brown color - 20" tall

chenille weed - brown to cream color - 4" tall

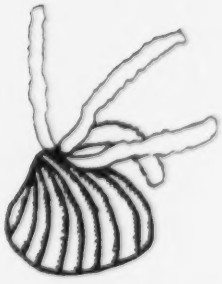


hooked weed - red to brown to purple color - 12" tall

prickly weed - tan to green to brown color - 10" tall

sea lettuce - green - 8" tall

flat fingers - brown to green color - 14" tall
or - red - 6" tall



mermaid's hair - green - tube like - attaches to shells - 3" tall

Algae - grow on the mud bottom and are found floating.

Grasses

turtle grass - grows farther from shore in shallow holes - 12" tall, ½" wide

manatee grass - grows far from shore in deep water - 12" tall

shoal grass - grows near shore, uncovered at very low tides - 5" tall

Grasses - grow in mud and sand on the bottom.

Seeds and Seedlings

red mangrove - 10" tall

Australian pine - 3/4" round

black mangrove - 3/4" bean

white mangrove - 3/4" tall

buttonwood - 3/4" round

Seeds and seedlings - grow on the shore and not in the water. They may be found floating.

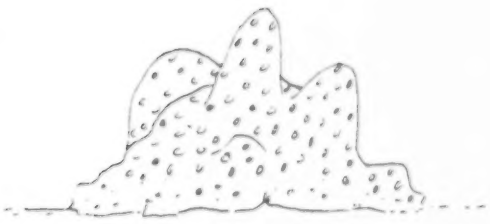
CONSUMER SECTION

A consumer is

a living thing that cannot make its own food

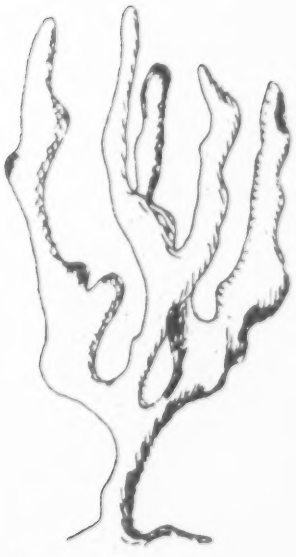
but must eat other plants and animals to get its energy.

Animals That Look Like Plants



sulphur sponge - yellow - 10-12" across

sea whip - a soft coral - bright colors - 15" tall

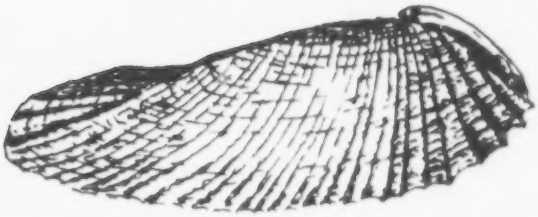


dead man's fingers - reddish-brown color - 10-15" tall

Animals That Look Like Plants

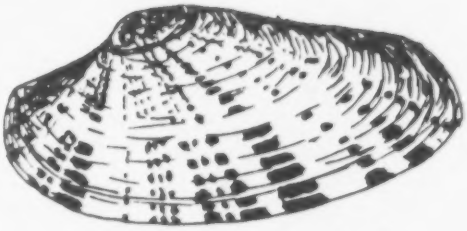
Colonial animals - have many individuals living together in one large group. These animals eat microscopic plants and animals.

Two-Shell Animals

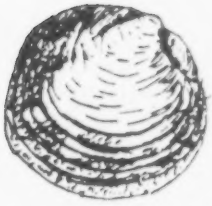


angel wing - up to 8"

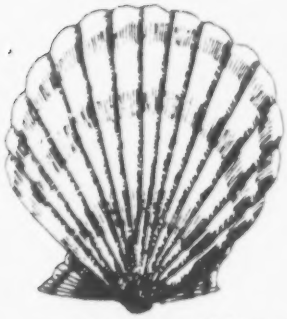
broad-ribbed cardita - 1-1½"



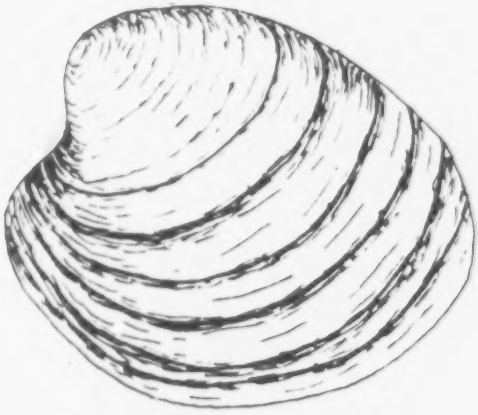
sunray venus - up to 5"



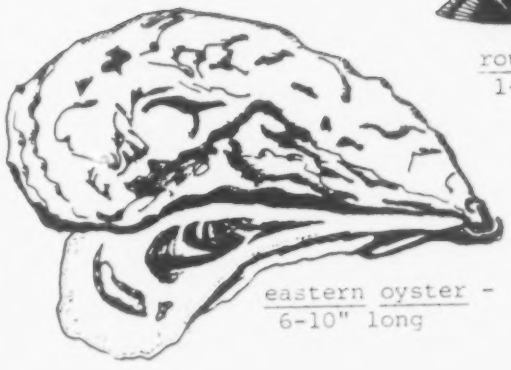
elegant dosinia - 1¼"



rough scallop - 1-3"



hardshell clam - 3-5"



eastern oyster - 6-10" long

Are shells alive? No. They are the home for an animal. The animal makes its shell. They must make it bigger as the animal grows. Shells are evidence of animals who live here.

Can you find a live two-shell animal? Look for one with the two shells still tightly closed.

Two-Shell Animals - (bivalves, like clams) eat microscopic plants and animals.

One-Shell Animals

NOTE: If you see claws sticking out of a shell, you may have a hermit crab inside a snail's old shell.

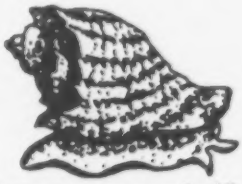
Plant eaters - herbivores

fly-specked cerith
3/4-1"

bubble shell - ¼-1"

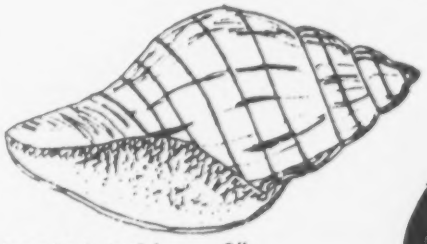
periwinkle - 1-1¼"

Animal-eaters - carnivores



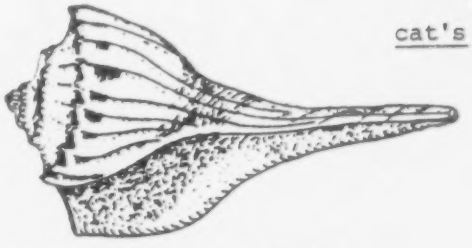
kings crown - 2-4"

fighting conch - 3-4"



banded tulip - 3"

cat's eye - 1-3"



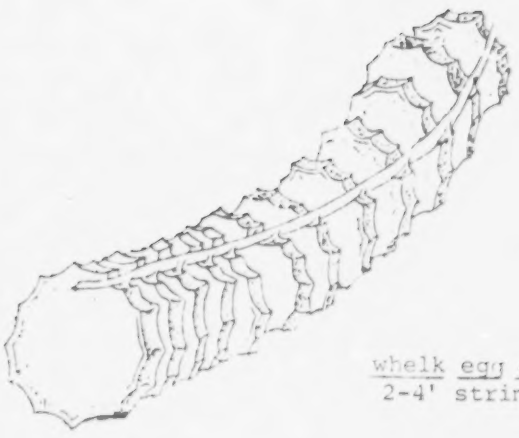
lightning whelk - 7-10"

Plant eaters - herbivores

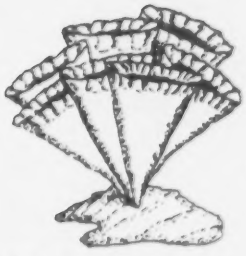
Animal-eaters - carnivores

One-Shell Animals

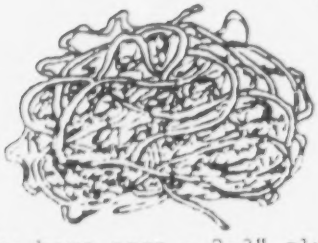
Eggs and Egg Cases



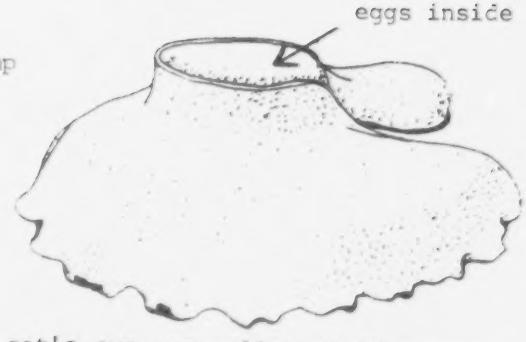
whelk egg case - 1" across
2-4' strings



tulip egg case - 1" tall



sea hare eggs - 2-3" clump



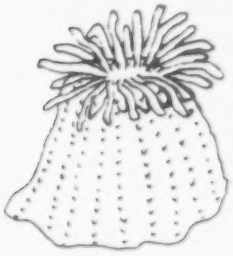
cat's eye egg collar -6-8" across

worm eggs -
1-2" ball

Eggs and Egg Cases - are laid by an animal.

Soft-Bodied Animals

comb jelly - eats fish, crabs, shrimp - ½-2"

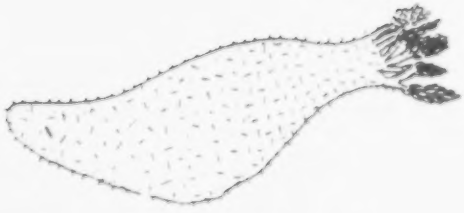


sea anemone - eats small plants and animals or dead food found in the water - 1"

decorator worm tube - eats small animals found in the water - 3-5" long, ½" across

lugworm pile - eats dead and decaying plants and animals found in the sand - 1-4"

sea squirt - squirts water - eats microscopic plants and animals - ½-2"

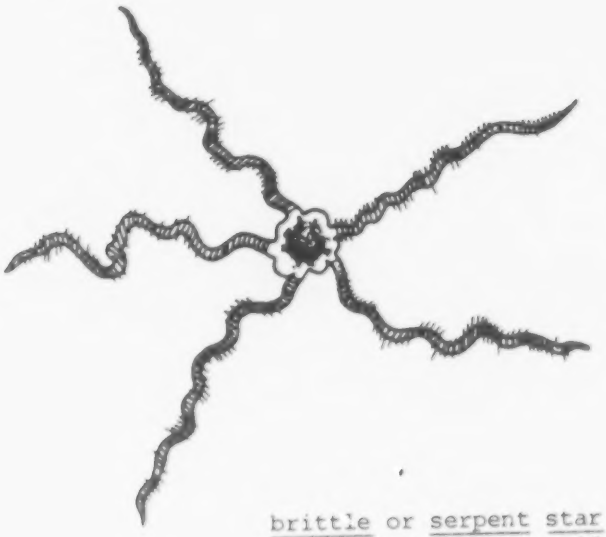


sea cucumber - eats dead and decaying plants and animals found in the sand - 3-5" long

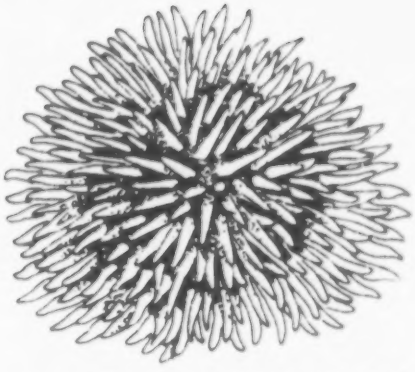
sea pork - hard wax-like lump - eats microscopic plants and animals - 2-6" and larger

Soft-Bodied Animals

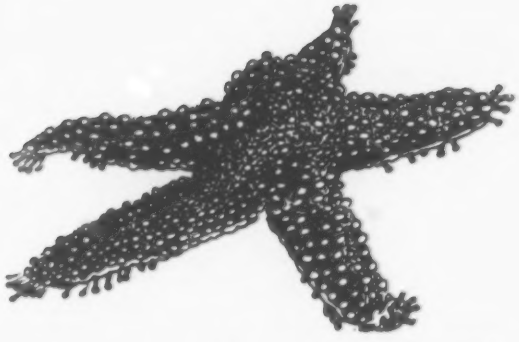
Prickly Animals



brittle or serpent star - body less than ¼" - arms 2" long



sea urchin - average 2" high and 4" wide



starfish - up to 15" across

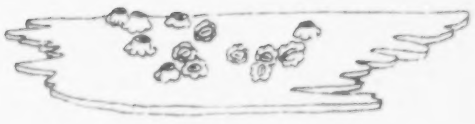
Prickly Animals - craw over mud, sand, rocks, and logs on the bottom. These animals eat living plants and dead and decaying plants and animals.

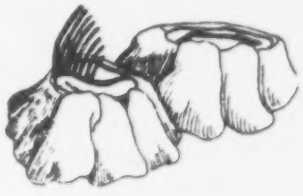
Shrimp and Relatives

amphipod - to ½" long

isopod - 3/4-1" long

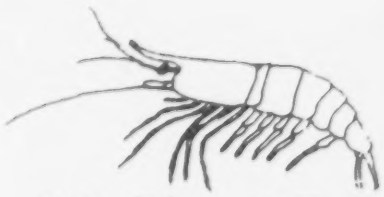
*eat dead and decaying plants and animals





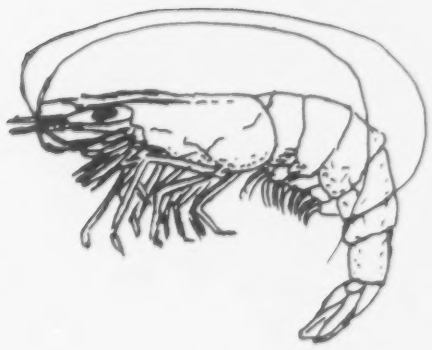
barnacle - lives attached to shell, log, or pier - up to 2" across

broken-back shrimp - 1" long



grass shrimp - green - 1-1½" long

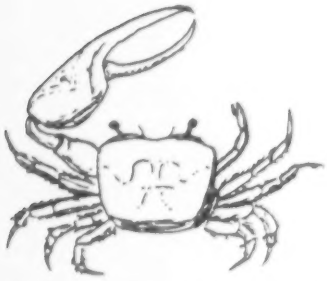
pistol shrimp - eats fish - ½-3" long



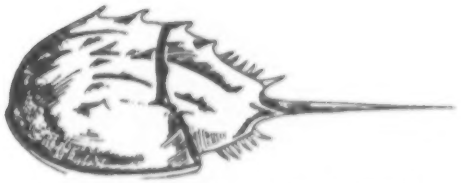
common shrimp - clear or gray color - ½-8" long

Shrimp and Relatives - (crustacea) most eat microscopic plants and animals.

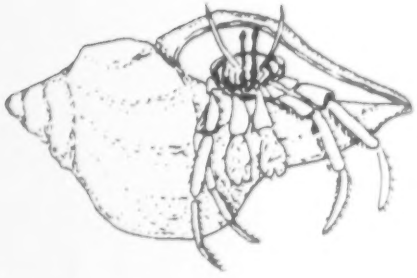
Crabs



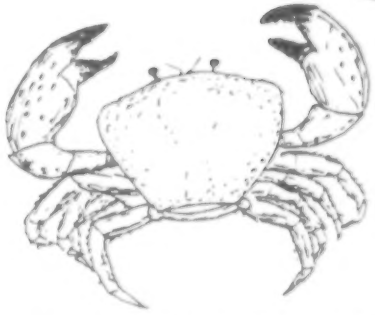
fiddler crab, (male pictured - females have 2 little claws) - lives on the shore - 1"



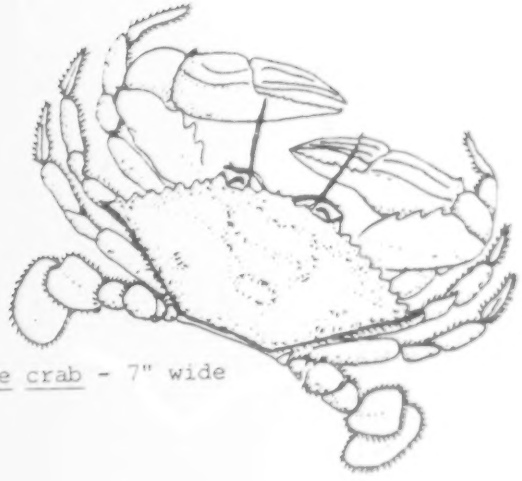
horseshoe "crab" - not a true crab; related to spiders! - up to 20" long



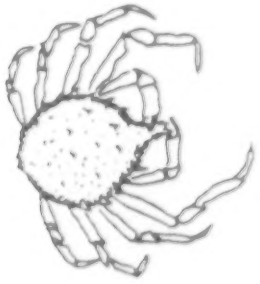
hermit crab - lives in "borrowed" shell - 1-2"



stone crab - hides inside things - 5-8"

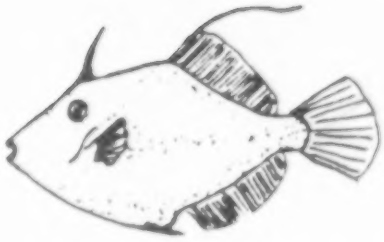


blue crab - 7" wide

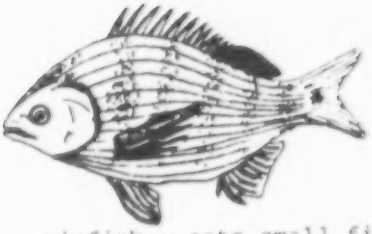


spider crab - 3"

Crabs - eat dead plants and animals and catch live fish.



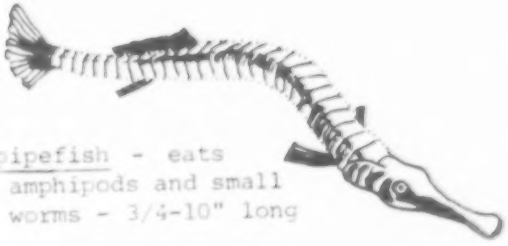
file fish - eats algae, other plants, and some worms and barnacles - 1-6" long



pinfish - eats small fish, crabs, and worms - 1-8"long

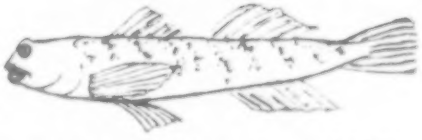
smooth puffer - eats barnacles, small snails, crabs, shrimp, amphipods, & worms - 1-12" long

spiny boxfish - eats barnacles, small snails, crabs, shrimp, amphipods, and worms - ½-8" long



pipefish - eats amphipods and small worms - 3/4-10" long

seahorse - eats small worms and amphipods - ½-2" long

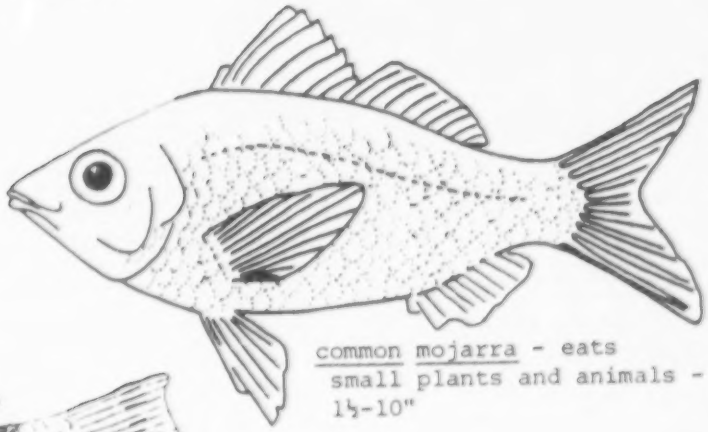


goby - eats small crabs, shrimp, and amphipods - ½-2" long

lizard fish - eats small fish, crabs, shrimp, and worms - 1-16" long

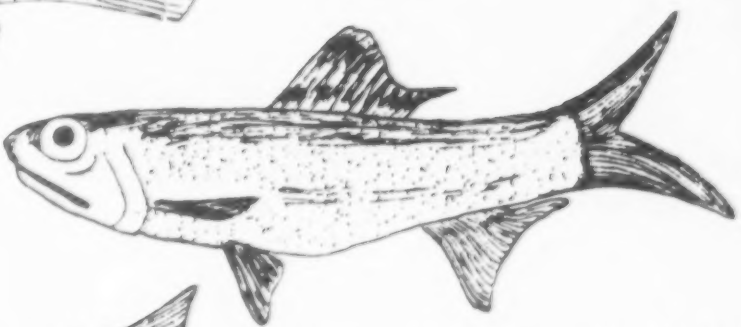
bigheaded sea robin - eats fish, crabs, amphipods, shrimp, worms, and some small plants - 1-12" long

gulf flounder - eats plants, worms, shrimp, and small fish - 1-30" long

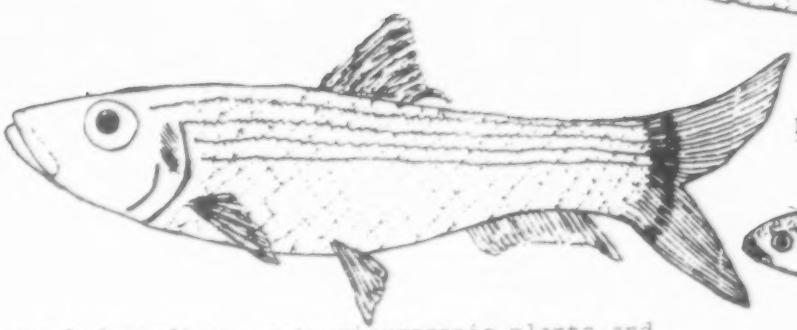


common mojarra - eats small plants and animals - 1½-10"

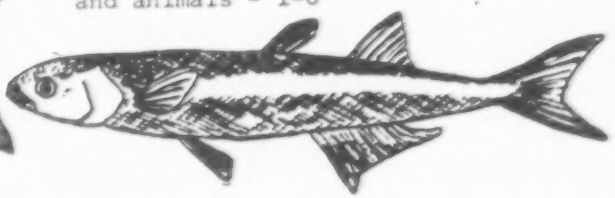
gulf whiting - eats shrimp, crabs, amphipods, and worms - 1-20"



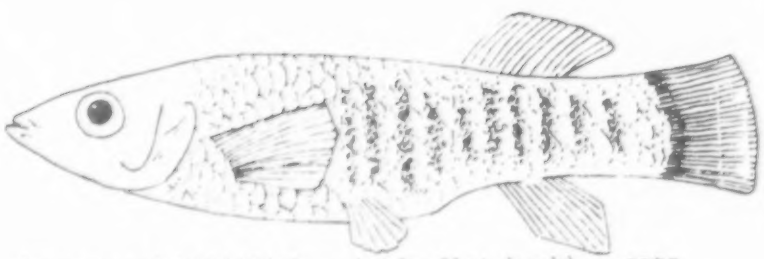
bay anchovy - eats microscopic plants and animals - 1-6"



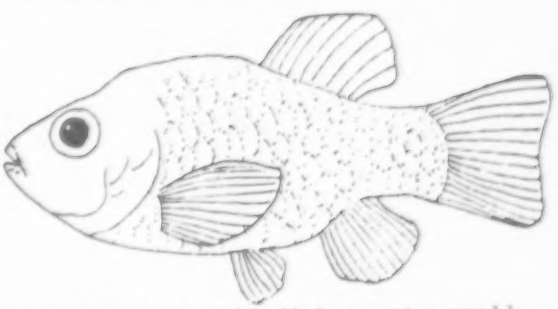
scaled sardine - eats microscopic plants and animals - 1-6"



tidewater silversides - eats small worms and other animals - 3/4-3"

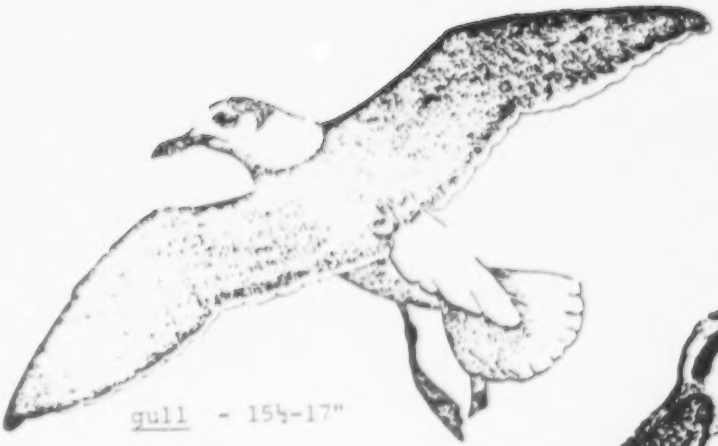


long-nosed killifish - (wide flat back) - eats small animals and plants - ½-6"

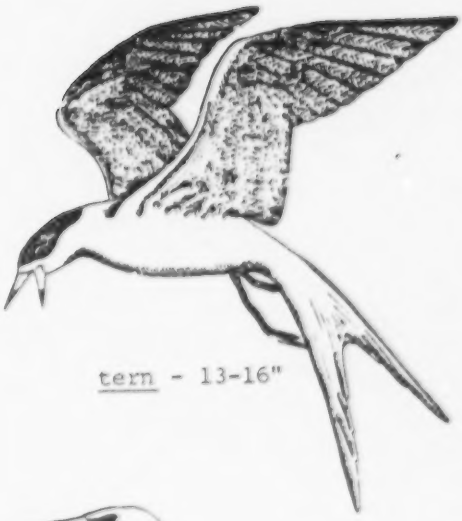


short-nosed killifish - eats small animals and plants - 3/4-4"

Birds

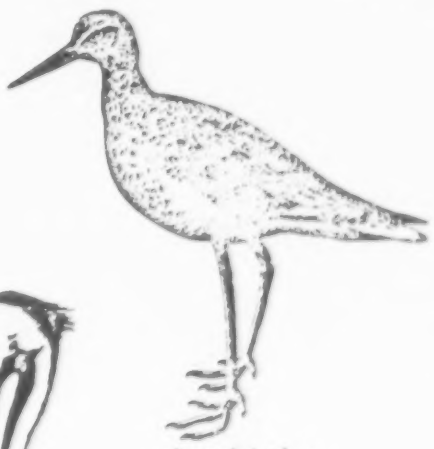


gull - 15½-17"

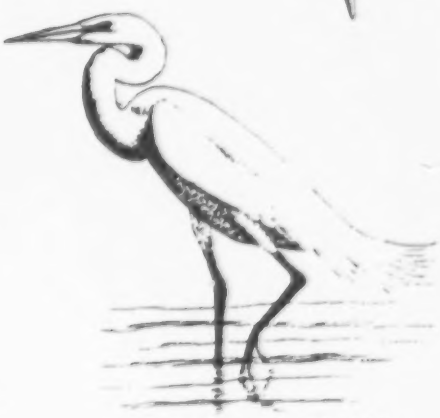


tern - 13-16"

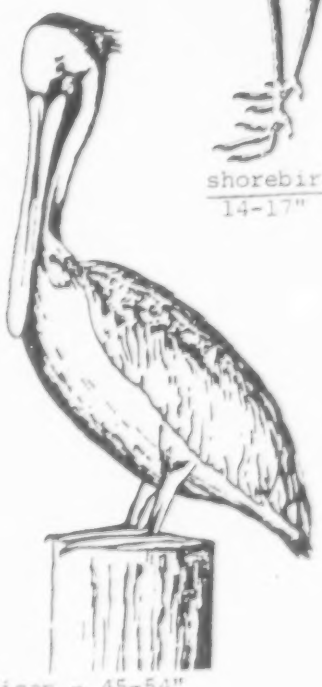
osprey - 21-25"



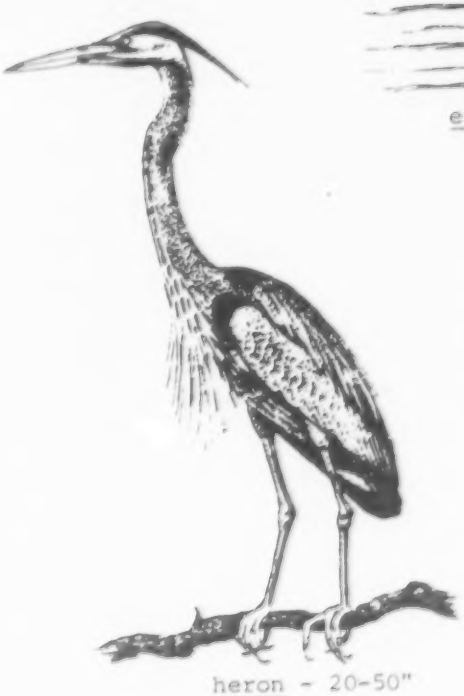
shorebird - 14-17"



egret - 22-38"



pelican - 45-54"



heron - 20-50"

Birds - eat small fish, shrimp, clams, crabs, and some decayed plants and animals.

DECOMPOSER SECTION

A <u>decomposer</u> is
a living thing that breaks down
the remains and wastes of plants and animals.

Decomposers

Since most decomposers are microscopic, we will not be able to see many of them at the mudflat today. We can look for evidence that they are here. Find a dead animal or plant along the shore. Smell it.

MUDFLAT TALLY SHEET

PRODUCERS

Algae	Grasses	Seeds/Seedlings

CONSUMERS

Sponges	2 Shell Animals	1 Shell Animals	Eggs & Egg Cases

Soft-Bodied Animals	Prickly Animals	Shrimp and Relatives

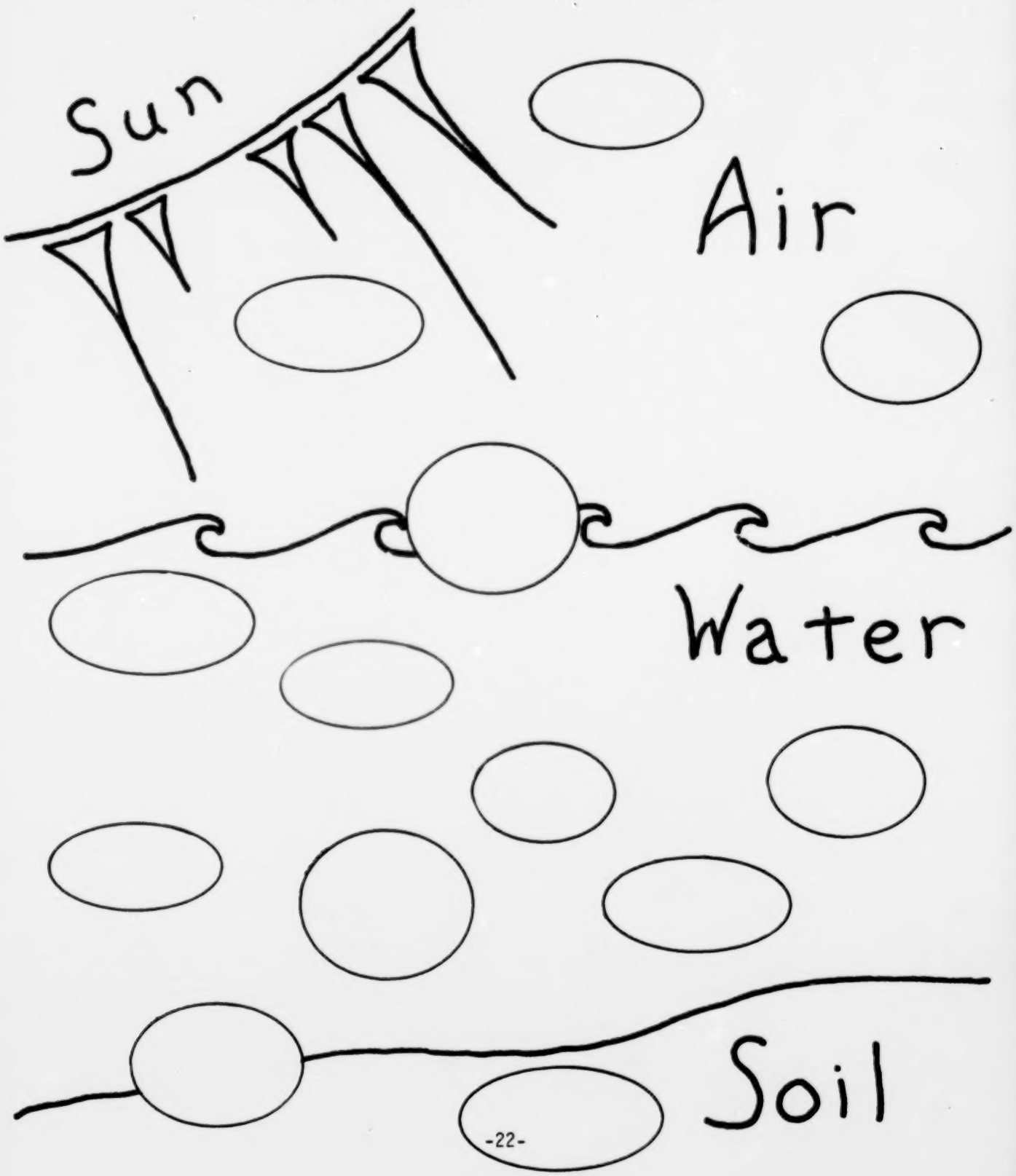
Crabs	Fish	Birds

DECOMPOSERS

Bacteria	Fungi

Web of Life Worksheet

Listen for directions from your teacher.



Can you tell what these are?

Scientific Names

Page & Title	Common Name	Scientific Name
p. 4 - Algae	shaggy weed	Dasya sp.
	hooked weed	Dynea sp.
	prickly weed	Acanthophora sp.
	sea lettuce	Ulva sp.
	graceful red weed	Gracilaria sp.
	mermaid's hair	Enteromorpha sp.
	flat fingers	-Dictyota sp. or -Gracilaria sp.
p. 5 - Grasses	turtle grass	Thalassia testudinum
	manatee grass	Cymodocea (Syringodium filifolia)
	shoal grass	Halodule wrightii
p. 6 - Seeds & Seedlings	Australian pine	Casuarina equisetifolia
	red mangrove	Rhizophora mangle
	black mangrove	Avicennia nitida/A. germinans
	white mangrove	Laguncularia racemosa
	buttonwood	Conocarpus erecta
p. 8 - Animals That Look Like Plants	sulphur sponge	Clinna celata
	sea whip	Leptogorgia virgulata
	dead man's fingers	Chelana arbuscula
p. 9 - Two Shell Animals	angel wing	Cyrtopleura costata
	broad-ribbed cardita	Cardita floridana
	quahog venus	Macrocallista nimbosa
	elegant dosinia	Dosinia discus
	rough scallop	Aequipecten muscosus
	hardshell clam	Mercenaria campechiensis
	eastern oyster	Crassostrea virginica

Page & Title	Common Name	Scientific Name
p. 14 - Shrimp Relatives	amphipod	Ligyda baudiniana
	isopod	-Paleanthelgia longicornis -Edotea sp. -Cirolanid exilis
	barnacle	Balanus sp.
	broken-back shrimp	Hippolyte zostericola
	grass shrimp	Palaemonetes vulgaris
	pistol shrimp	Crangon heterochaelis
	common shrimp	Penaeus setiferus
p. 15 - Crabs	fiddler crab	Uca pugilator
	hermit crab	-Clibanarius vittatus -Pagurus annulipes
	stone crab	Menippe mercenaria
	blue crab	Callinectes sapidus
	spider crab	Mithrax spinosissimus
	horseshoe "crab"	Limulus polyphemus
p. 16 - Fish	file fish	-Monacanthus setifer or -Aluterus schoepfi
	pinfish	Lagodon rhomboides
	smooth puffer	Lagocephalus laevigatus
	spiny boxfish	Chilomycterus schoepfi
	gulf pipefish	Syngnathus scovelli
	lined seahorse	Hippocampus erectus
	crested goby	Lophogobius cyprinoides
	lizard fish	Synodus foetens
	gulf flounder	Paralichthys lethostigma
	bighead sea robin	Prionotus tribulus

Page & Title	Common Name	Scientific Name
p. 40 - One Shell Animals	fly-specked cerith	Cerithium muscarum
	bubble shell	-Bulla striata or B. elisae -Bulla occidentalis
	angulate periwinkle	Littorina angulifera
	kings crown	Melongena corona
	banded tulip	Fasciolaria hunteria
	fighting conch	Strombus pugilis
	cats eye	Polinices duplicatus
	lightning whelk	Busycon contrarium
p. 11 - Eggs and Egg Cases	whelk	Busycon sp.
	tulip	Fasciolaria sp.
	sea hare	Aplysia brasili
	cats eye	Polinices duplicatus
	worm	unknown
p. 12 - Soft Bodied Animals	comb jelly	-Lampocteis cruentiventer -Beroe sp.
	sea anemone	Haliplanella luciae
	decorator worm	Diopatra cuprea
	lugworm	Arenicola cristata
	sea cucumber	Holothuria floridana
	sea squirt	Styela partita/S. plicata
	sea pork	Aplysina fistularis
p. 13 - Prickly Animals	serpent star	-Ophiolepis elegans -Ophioderma brevispinum
	sea urchin	Lytechinus variegatus
	starfish	-Astropecten duplicatus -Luidia clathrata

Page & Title	Common Name	Scientific Name
p. 17 - Fish	common anjarra	Harengula pensacolae
	gulf whiting	Menticirrhus littoralis
	bay anchovy	Anchoa mitchilli
	scaled sardine	Harengula pensacolae
	tidewater silverside	Menidia beryllina
	long-nosed killifish	Fundulus majalis
	short-nosed killifish	Fundulus heteroclitus
p. 18 - Birds	gull (laughing)	Larus atricilla
	tern (common)	Sterna hirundo
	osprey	Pandion haliaetus
	shorebird (willet)	Catoptrophorus semipalmatus
	egret (American)	Casmerodius albus
	heron (great blue)	Ardea herodias
	pelican (brown)	Pelecanus occidentalis

102

This publication is one of the teaching units in the community studies series developed by the Lee County Schools, Florida.

The community study series is designed to assist teachers and students in learning through experience how the Lee County communities function, and the rights and responsibilities each of us shares in maintaining a healthy, productive community.

By systematically experiencing our community, students tend to see the pattern that connects the natural and cultural environment, and how each of us is an independent agent for change.

The community study instructional units have been field tested by teachers and students.

All guides are COPYRIGHTED. Full permission is granted for non-profit educational use.

The units have been produced by the staff of the DEPARTMENT OF INSTRUCTIONAL DEVELOPMENT SERVICES AND ENVIRONMENTAL EDUCATION of Lee County School system:

Bill Hammond	Director
Jo Ellen Kessler	Coordinator
Craig Hortman	Resource Teacher
Rick Tully	Resource Teacher
Keith Hanson	Resource Teacher
Neil Wilkinson	Resource Teacher
Cindy Bear	Resource Teacher
Brian Murphy	Resource Teacher
Tom Miller	Helping Teacher
Lynette Dean	Adv. County Staff Secretary
Deborah Bovee	County Staff Secretary

with special contributions from former IDS/EE staff members, Lee County teachers, district staff, students, and members of the community.

Lee County Schools
Instructional Development Services/
Environmental Education
2055 Central Avenue
Fort Myers, Florida 33901
813-275-3033